All Cartographic Orders thru **CO. 012/04** (dated July 29, 2004) and all Memorandums dated thru **July 26, 2004** have been incorporated into this document. This document is considered current and complete as of: **AUGUST 5, 2004.**

NAUTICAL CHART MANUAL

VOLUME TWO:

Definitions, Abbreviations, Symbology & References

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 010/03 May 29, 2003

FILE WITH NAUTICAL CHART MANUAL, VOLUME 2, TABLE OF CONTENTS

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual, Volume 2, Table of Contents

APPLICATION: Nautical Chart Manual

Effective immediately, the attachment replaces the Table of Contents in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment revises the listing under the heading - APPENDIX IV: MISCELLANEOUS REFERENCES by:

1. eliminating all references to area and route charts (these formats are no longer produced by the Marine Chart Division.

2. eliminating the inset format and placement samples (will be presented in Chapter 2, Volume 1)

3. adding margin note and format samples for small-craft pocket fold sides

The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Seventh (1992) Edition, immediately after the Volume 2 title page. This cartographic order supersedes cartographic order 010/01 dated May 23, 2001.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

NAUTICAL CHART MANUAL

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VOLUME TWO

APPENDICES

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JULY 1, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Conversion to Adobe (.pdf format): **VOLUME 2** of the Nautical Chart Manual (Intranet Version)

Effective immediately, the Intranet version of the Nautical Chart Manual, **VOLUME 2**, Seventh (1992) Edition will now be presented in Adobe (.pdf) format.

The Intranet location of the Nautical Chart Manual, **(Volumes 1 and 2)** is accessible either through the Office of Coast Survey Intranet or by directly typing the following web addresses:

Volume 1: http://ocsnet.ncd-tcn.noaa.gov/mcd/chartman/ncm_vol1.pdf

Volume 2: http://ocsnet.ncd-tcn.noaa.gov/mcd/chartman/ADOBE_NCM_VOL_TWO_Defs_Abbs_Sym.pdf

Some of the advantages of the Adobe format include the following:

1. Document content, layout and formatting comparable to the analog copy of the Nautical Chart Manual.
2. Word search capability.
3. Easier accessibility of chapters through the use of pre-established bookmarks.
4. Size 8 1/2" x 11" page printing capability.
5. Improved graphics and note examples.
6. Unlimited view magnification capability, and,
7. More user-friendly document navigational tools.

To download a free copy of the ADOBE Reader 5.0, go to the following web address:

http://www.adobe.com/products/acrobat/readstep2.html

This memorandum is to be inserted into the Nautical Chart Manual, **VOLUME 2**, immediately after the Table of Contents..

NAUTICAL CHART MANUAL - VOLUME 2
DEFINITIONS, ABBREVIATIONS, SYMBOLOGY & REFERENCES
Seventh (1992) Edition

APPENDIX I - DEFINITIONS

Click on desired Section:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

U.S. Department of Commerce
Office of Coast Survey

NAUTICAL CHART MANUAL

APPENDIX I

DEFINITIONS

Introduction

The following glossary is presented as an authoritative source for mapping, charting and geodetic terms used in the nautical charting program. The terms and their definitions have been selected because they are perceived to be of specific cartographic interest and are expected to improve cartographer's understanding of nautical chart compilation. The terms may be encountered on nautical products, in source material received into the charting program, or through archival research.

An attempt has been made to exclude contradictory, controversial, incomplete, and duplicate definitions. Multiple definitions for a single term have been given when deemed appropriate. The definitions are extracted from the most authoritative sources of information available, both published and unpublished, with deletions in some instances but without other revision. These sources include texts, glossaries, technical reports, and other similar documents. The numbers in brackets following the definitions, i.e., [1], refer to the source references list.

Section Locator

Click on the appropriate letter below to go directly to the respective section of the glossary.

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A

ABANDONED. An adjective referring to a man-made facility no longer being used for its original purpose, as in "abandoned mine". The term may be used with a symbol, e.g.: beside an airport symbol, or with a place name, e.g.: Elma (Abandoned). [35]

ABYSS. A very deep, unfathomable place. The term is used to refer to a particular deep part of the ocean, or to any part below 300 fathoms. [1]

ACCRETION. The gradual building up of land over a long period of time, solely by the action of the forces of nature, on a beach by deposition of water or air-borne material. Artificial accretion is a similar build-up of land by reason of an act of man. Also called aggradation. [17]

ACCURACY. Closeness of an estimated (e.g., measured or computed) value to a standard or accepted value of a particular quantity. Accuracy is commonly referred to as "high" or "low", depending on the size of the difference between the estimated and standard values. [39]

ACCURACY CODE. Information in a coordination file header indicating the accuracy class of the data according to specific coding rules (see Code). [22]

ADDITIONAL SECONDARY PHASE FACTOR CORRECTION (ASF). A correction in addition to the secondary phase factor correction for the additional time (or phase delay) for transmission of a low frequency signal over a composite land-seawater path when the signal transit time is based on the free-space velocity. This correction is given in DMAHTC Pub. 221, LORAN-C Correction Table. The LORAN-C lattices overprinted on nautical charts may be compensated for additional secondary phase factor (ASF), particularly in the Coastal Confluence Zone. [1]

ADDRESS. (1) (ISO) A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (2) (ISO) To refer to a device or an item of data by its address. [20]

(1) A label, name, or number identifying a register, location, or unit where information is stored. (2) The operand part of an instruction. (3) In communications, the coded representation of the destination of a message. (4) To call a specific piece of information from the memory or to put it in the memory. [34]

ADP. (An Acronym) Automatic data processing. [20]

ADMIRALTY LAW. That branch of the body of the law which governs in maritime matters; administered in the United States by the Federal courts as a distinct legal system, the jurisdiction being exclusive and cannot be enlarged or restricted by state legislation. Admiralty jurisdiction requires the presence of two concurrent elements: (1) a navigable waterway which is part of an interstate or international highway, and (2) a vessel or craft used or capable of being used as a means of transportation on such waterway. [3]

ADRIFT. Afloat or unattached to shore or bottom. [37]

AERIAL CABLEWAY. A transportation device consisting of an endless cable supported on towers. Cars attached to the cable are used for moving people or materials. [35]

AERONAUTICAL BEACON. A visual aid to navigation, displaying flashes of white or colored light or both, used to indicate the location of airports, landmarks, and certain points of the Federal airways in mountainous terrain and to mark hazards. [1]

AERONAUTICAL LIGHT. A luminous or lighted aid to navigation intended primarily for air navigation. One intended primarily for marine navigation is called a Marine Light. Often shortened to Aero Light. [1]

AERONAUTICAL RADIOBEACON. A radiobeacon whose service is intended primarily for the benefit of aircraft. [1]

AEROTRIANGULATION. Triangulation for the extension of horizontal and (or) vertical control accomplished by means of aerial photographs. [25]

AEROTRIANGULATION, RADIAL. Aerotriangulation in which horizontal control extension is accomplished by a combination of resection and intersection using directions of images from the radial centers of overlapping photographs. Radial aerotriangulation can be done graphically or analytically, but it is assumed to be graphical unless otherwise specified.

A radial aerotriangulation is also termed a "radial plot" or a "minor control plot" or, inappropriately, "radial triangulation." The radial center for near-vertical photographs may be the principal point, the nadir, or the isocenter. A radial aerotriangulation is assumed to be made with the principal points as radial centers unless the modifying term designates otherwise, or unless the context states that a radial center other than the principal point was used. [39]

AFLOAT. Floating, as opposed to being aground. [17]

AGROUND. Touching, resting or lodged on the bottom of shallow water. The opposite is afloat. [17]

When a vessel rests on something solid other than the blocks in a drydock or slipway she is said to be aground. A vessel "takes the ground" when the tide leaves it aground for want of sufficient depth of water, a fairly frequent occurrence in open docks. [36]

AID TO NAVIGATION. Buoys, beacons, fog signals, lights, radiobeacons, leading marks, radio position fixing systems, radars, inertial systems, and generally any charted or otherwise published device serving the interests of safe navigation. See navigational aid. [17]

A device external to a craft, designed to assist in determination of position of the craft, a safe course, or to warn of dangers or obstructions. If the information is transmitted by light waves, the device is called a visual aid to navigation; if by sound waves, an audible aid to navigation; if by radio waves, a radio aid to navigation. Any aid to navigation using electronic equipment, whether or not radio waves are involved, may be called an electronic aid to navigation. The expression Aid to Navigation should not be confused with

Navigational Aid, a broad expression covering any instrument, device, chart, method, etc., intended to assist in the navigation of a craft. In British usage the terms aid to navigation and navigational aid are used without distinction. [1]

Any signal device external to a vessel or aircraft specifically intended to assist a navigator to determine his position or safe course, or to warn him of dangers or obstructions to navigation. [37]

AIRFIELD. Landing facility for aircraft, usually without a passenger terminal. The services offered for aircraft supply and maintenance are substantially less than those of an airport (q.v.). Airfields usually have legal limits which are delineated at 1:50,000 and larger scales. [35]

AIR-PHOTOGRAPH (AERIAL PHOTOGRAPH). Any photograph taken from the air. When used in a cartographic context, this term normally refers to photographs of the surface of the Earth (or other celestial body) taken downwards, vertically, or at a predetermined angle from the vertical. [21]

AIRPORT. Landing facility for aircraft usually with more than one runway and with facilities for handling passengers and air freight and for servicing aircraft. The legal limits of the airport are usually delineated at map scales of 1:50,000 and larger. [35]

AIRSTRIP. Landing facility for aircraft consisting of a single runway which is usually of gravel construction. Airstrips rarely have a boundary fence or a delineated legal limit. [35]

ALGEBRAIC LANGUAGE. An algorithmic language many of whose statements are structured to resemble the structure of algebraic expressions, e.g., ALGOL, FORTRAN. [20]

ALGORITHM (ISO). A finite set of well-defined rules for the solution of a problem in a finite number of steps, e.g., a complete specification of a sequence of arithmetic operations for evaluating sine x to a given precision. [20]

A defined process or set of rules that leads and assures development of a desired output from a given input. A sequence of formulas and/or algebraic/logical steps to calculate or determine a given task; processing rules. [34]

ALPHABETIC CHARACTER SET (ISO). A character set that contains letters and may contain control characters, special characters, and the space character, but no digits. [20]

ALPHANUMERIC. Pertaining to character set that contains letters, digits, and usually other characters such as punctuation marks. Synonymous with alphameric. [20]

A contraction of alphabetic and numeric. Pertaining to a character set that contains letters, digits, and usually other characters, such as punctuation marks. Synonymous with "alphameric." [22]

ALPHANUMERIC CHARACTER SET (ISO). A character set that contains both letters and digits and may contain control characters, special characters, and the space character.

ALTERNATING. A light showing different colors alternately, or a continuous steady light which shows a change of color. [37]

ALTITUDE. (1) The distance of a location above a reference surface. The most usual reference surface is sea level. (2) The distance of a location above the physical surface of the Earth. "Altitude" is a generic term that defies exact technical definition. It is evident that distance must be determined along some suitable line. "Suitable" connotes a line whose direction closely approximates a perpendicular to the surface and passes through the location in question. See also Elevations, Height. [39]

AMERICAN ASSOCIATION OF PORT AUTHORITIES (AAPA). Founded in 1912 to develop and encourage water-based transportation, AAPA is currently involved with the establishment of deepwater ports (DWP's). [38]

AMERICAN BUREAU OF SHIPPING (ABS). Founded in 1862, ABS is a nonprofit self-regulatory organization for maritime interests. It is concerned with standards for design and construction, and the periodic survey of ships and other structures to ensure their fitness. It maintains the American Bureau of Shipping Information Retrieval System (ABSIRS), which contains pertinent facts and characteristics about merchant vessels. In a recent reorganization, ABS established an Ocean Engineering Division to work with the development of offshore platforms and powerplants, and underwater vehicles and habitats. [38]

AMERICAN CONGRESS ON SURVEYING AND MAPPING (ACSM). Founded in 1941 to promote the science of surveying and mapping, ACSM has added sections on marine surveying and mapping in recent years. [38]

AMERICAN GEOPHYSICAL UNION (AGU). Founded in 1919, AGU promotes the study of geophysics and assists in coordinating geophysical research. Of interest to marine scientists are its sections on hydrology, meteorology, oceanography, seismology, and volcanology. It represents the United States at the International Union of Geology and Geophysics (IUGG). [38]

AMERICAN INSTITUTE OF MERCHANT SHIPPING (AIMS). AIMS was founded in 1969, (and represents the interests of the U.S. merchant shipping industry in the promotion, ownership, and operation of American-flag vessels.) [29]

AMERICAN PETROLEUM INSTITUTE (API). Founded in 1919 as a trade association, API promotes the interests of the petroleum industries, represents them in contracts with the Government, sponsors research on environmental protection and the prevention and control of oil pollution, and sets standards and performance controls for the industry. It sponsors a computerized Central Abstracting and Indexing Service (CAIS). [38]

AMERICAN SOCIETY OF PHOTOGRAMMETRY (ASP). ASP was founded in 1934. One of its objectives is to promote the use of aerial photography and remote sensing for studying the environment. [38]

ANCHORAGE. (1) An area where a ship anchors or may anchor, either because of suitability or designation. (2) Explosives anchorage-an area set apart for anchored ships discharging or receiving explosives. (3) Exposed anchorage-an anchorage that is unprotected from such dangers as weather, sea, or ice. (4) Prohibited anchorage-a section of a harbor kept free of anchored ships. (5) Temporary anchorage-a place where ships can anchor only under favorable conditions and where ships must have power ready to get under way. [12]

A place where a ship anchors or may anchor. An area set apart for anchored vessels in a harbor. A suitable place for anchoring is sheltered from wind and sea, does not interfere with harbor traffic, and has a sea bottom that gives good holding to anchors. The anchorage space allotted to a vessel should include a circle with a radius equal to the combined length of anchor cable and ship. A depth of 7 to 8 fathoms at low water is usually considered sufficient for ordinary requirements. [36]

An area in which vessels, seaplanes, etc., may anchor. An anchorage is usually a sheltered position in which the depth, and nature of the bottom is suitable for ships or planes to anchor. [35]

ANCHORAGE CHART. A nautical chart showing prescribed or recommended anchorages. Such a chart may be a harbor chart overprinted with a series of circles, each indicating an individual anchorage. [1]

ANOMALY. (1) (general) A deviation from the norm. (2) (geodesy) A deviation of an observed value from a theoretical value, due to an abnormality in the observed quantity. [23]

ANOMALY, MAGNETIC. See Local Magnetic Disturbance. [17]

APPARENT SHORELINE. This is the seaward limits of marine vegetation, such as mangrove, marsh grass, or trees in water that would reasonably appear to the mariner from a distance to be the fast shoreline. The seaward limits of kelp, low grass in water, and other low-lying vegetation normally do not constitute an apparent shoreline. [31]

A line drawn on the chart in lieu of the mean high water line or the mean water level line in areas where either may be obscured by marsh, mangrove, cypress, or other type of marine vegetation. This line represents the intersection of the appropriate datum with the outer limits of vegetation and appears to the navigator as shoreline. [1]

APPROXIMATE CONTOUR. A contour substituted for a normal contour whenever there is a question as to its reliability (reliability is defined as being accurate within one-half the contour interval). [10]

APPROXIMATE POSITION. A position that is considered to be less than third-order accuracy, but is generally considered to be within 100 feet of its correct geographic location. The method of location may be an indication of the recorded accuracy. [29]

APPROXIMATION. (1) A value close to, but not exactly, the correct value for a quantity. (2) The process of obtaining approximations. Two different methods are: direct, in which an approximation is calculated only once; and successive, in which a value, called the first approximation, is calculated and then used in repetitions of the calculations to get values called "second approximation", "third approximation", etc., each of which is closer and closer to the correct value. This process is repeated until either a satisfactory value is obtained or no change in value results. This method is also known as the "iterative process of approximation." [39]

AQUEDUCT. A conduit or artificial channel for the conveyance of water, often elevated, especially one for the conveyance of a large quantity of water that flows by gravitation. [1]

ARCHIPELAGO. An area of water studded with many islands or with a group of islands; also, such a group of islands. [3]

A sea or broad expanse of water studded with many islands or a group of islands; also, such a group of islands. [4]

ARC OF VISIBILITY. The portion of the horizon over which a lighted aid to navigation is visible. [37]

The arc of a light sector, designated by its limiting bearings as observed from seaward. [1]

AREA CHARTS. These U.S. National Ocean Service charts are versions of conventional nautical charts overprinted with additional small-craft information; and published in the pocket fold format. [29]

AREA FEATURE. A feature extending by definition over an area. Represented on maps by an outline, a solid or screened color, crosshatching, a regular pattern of symbols spread over the area, or a combination of these possibilities. Contrast with "point feature" and "line feature." [22]

AREAL FEATURE. A topographic feature, such as sand, swamp, vegetation, etc., which extends over an area. It is represented on the published map or chart by a solid or screened color, by a prepared pattern of symbols, or by a delimiting line. [1]

AREA TO BE AVOIDED. A routing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ship. [19]

ARM OF THE SEA. A narrow portion of the sea projection from the main body. The expression is often shortened to 'arm'. [17]

ARROYO. The course of an intermittent stream steep-cut in loose earth; a coulee; a steep-walled trenchlike valley. (Local in Southwest.) [4]

ARTICULATED LIGHT. An articulated light is a vertical pipe structure that oscillates around a universal coupling connected to a sinker. The structure is kept upright by the buoyancy of a submerged flotation chamber. It is designed primarily to mark narrow channels with greater precision than conventional buoys. [29]

ARTIFICIAL HARBOR. Other than an improved natural harbor, a harbor where the desired protection from wind and sea is obtained from breakwaters, moles, jetties, etc. See also Natural Harbor. [1]

A harbor where the desirable shelter from wind and sea has been obtained artificially be the building of moles, piers, breakwaters and jetties. Also applied to harbors created by sinking concrete barges, vessels and the like to form a temporary sheltered anchorage. [36]

ARTIFICIAL INTELLIGENCE. (1) The capability of a device to perform functions that are normally associated with human intelligence, such as reasoning, learning, and self-improvement. (2) See also Machine Learning. [20]

(1) Research and study in methods for the development of a machine that can improve its own operations. The development or capability of a machine that can proceed or perform functions that are normally concerned with human intelligence, as learning, adapting, reasoning, self-correction, automatic improvement. (2) The study of computer and related techniques to supplement the intellectual capabilities of man. As man has invented and used tools to increase his physical powers, he now is beginning to use artificial intelligence to increase his mental powers. In a more restricted sense, the study of techniques for more effective use of digital computers by improved programming techniques. [34]

ARTIFICIAL ISLAND. An island constructed for the purpose of mineral development. [29]

ASSEMBLY LANGUAGE (ISO). A computer-oriented language whose instructions are usually in one-to-one correspondence with computer instructions and that may provide facilities such as the use of macroinstructions. Synonymous with computer-dependent language. [20]

A machine-oriented language for programming, such as Argus or Easy, which belongs to an assembly program or system. [34]

ATOLL. A coral island or islands, consisting of a belt of coral reef surrounding a central lagoon. [3]

A ring-shaped coral reef which has closely spaced islands or islets on it enclosing a deeper central area or lagoon. The diameter may vary from less than a mile to 80 or more. [1]

AUDIBLE AID TO NAVIGATION. An aid to navigation transmitting information by sound waves. [1]

AUTHORITY NOTE. The note included on a chart which gives the names of the federal agencies that have contributed to the information used in the compilation. [3]

AUTOMATED CARTOGRAPHIC. A system that performs a particular cartographic process automatically. Sometimes confused with computer-assisted cartographic systems or semiautomated systems. [22]

AUTOMATIC DATA PROCESSING (ADP). Data processing by means of one or more devices that use common storage for all or part of a computer program and also for all or part of the data necessary for execution of the program; that execute userwritten or user-designated programs; that perform user-designated symbol manipulation, such as arithmetic operations, logic operations, or character-string manipulations; and that can execute programs that modify themselves during their execution. Automatic data processing may be performed by a stand-alone unit or by several connected units. [20]

Data processing performed by a system of electronic or electrical machines so interconnected and interacting as to reduce to a minimum the need for human assistance or intervention. [34]

AUTOMATIC TIDE GAGE. An instrument that automatically registers the rise and fall of the tide. In some instruments, the registration if accomplished by recording the heights at regular time intervals in digital format; in others, by a continuous graph of height against time. The automatic gages used by the National Ocean Service are of both types. See Tide Gage. [7]

AUTOMATION. (1) (ISO) The implementation of processes by automatic means. (2) The theory, art, or technique of making a process more automatic. (3) The investigation, design, development, and application of methods of rendering processes automatic, self-moving, or self-controlling. [20]

The generalized term used to convey the dedicated use or exploitation of automatic machines or devices designed to control various processes, such as machine tools, routine office procedures, accounting, and several thousand other applications. [34]

(1) The implementation of processes by automatic means. (2) The theory, art, or technique of making a process more automatic. (3) The investigation, design, development, and application of methods of rendering processes automatic, self-moving, or self-controlling. (4) The conversion of a procedure, a process, or equipment to automatic operation. [22]

AWASH. Situated so that the top is intermittently washed by waves or tidal action. The term applies both to fixed objects such as rocks, and to floating objects with their tops flush with or slightly above the surface of the water. See also Rock Awash, Submerged, Covers and Uncovers. [1]

AXIS. (1) Any line along which measurements are made in determining the coordinates of a point, or any line from which angles are measured for the same purpose. An axis usually serves as a line reference such that one of the coordinate of a point lying on the axis is zero. (2) A line with respect to which a geometric figure is symmetrical. (3) Any line about which a body rotates or revolves. In geodetic and astronomic instruments, the line usually coincides with the axis (sense 2 above) of a cylindrical rod or tube carried in a bearing, so the term "axis" is also applied to this cylinder. (4) A line connecting two distinguished points. E.g., the magnetic poles of the Earth are joined by the magnetic axis. [39]

AZIMUTH. A horizontal angle reckoned clockwise from the meridian. In the basic control surveys of the United States of America and in those of many other countries, azimuths are currently reckoned clockwise from south. In military control surveys of most countries, including the U.S.A., azimuths are reckoned clockwise from north. In 1986, when the U.S. National Geodetic Survey begins publishing geodetic data on the North American Datum of 1983(NAD 83), the measurement of azimuths will be referenced from the north for basic control surveys in the U.S.A. [39]

The horizontal direction of a celestial point from a terrestrial point, expressed as the angular distance from a reference direction. It is usually measured from 000° at the reference direction clockwise through 360°. An azimuth is often designated as true, magnetic, compass, grid, or relative as the reference direction is true, magnetic, compass, or grid north, or heading, respectively. Unless otherwise specified, the term is generally understood to apply to true azimuth which may be further defined as the arc of the horizon, or the angle at the zenith, between the north part of the celestial meridian or principal vertical circle and a vertical circle, measured from 000° at the north part of the principal vertical circle clockwise through 360°. When the angle is measured in either direction from north or south, and labeled accordingly, it is properly called azimuth angle; when measured either direction from east or west, and labeled accordingly, it is called amplitude. [1]

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BACK AZIMUTH. An azimuth 180° from a given azimuth. [1]

BACK RANGE. A range observed astern, particularly one used as guidance for a craft moving away from the objects forming the range. [1]

BACKSHORE. That part of a beach which is usually dry, being reached only by the highest tides, and by extension, a narrow strip of relatively flat coast bordering the sea. See also Foreshore. [1]

That zone of the shore or beach lying between the foreshore and the coastline and acted upon by waves only during severe storms, especially when combined with exceptionally high water. Also Backbeach. It comprises the Berm or Berms. [14]

BALD. A high rounded knob or mountain top, bare of forest. (Local in Southern States.) [4]

BANK. (1) An elevation of the sea floor typically located on a shelf and over which the depth of water is relatively shallow but sufficient for safe surface navigation. Reefs or shoals, dangerous to surface navigation, may rise above the general depths of a bank. (2) A shallow area of shifting sand, gravel, mud, etc., as a sand bank, mud bank, etc. (3) A ridge of any material such as earth, rock, snow, etc., or anything resembling such a ridge, as a fog bank or cloud bank. (4) The edge of a cut or fill. (5) The margin of a watercourse. (6) A number of similar devices connected so as to be used as a single device. [1]

(1) The rising ground bordering a lake, river, or sea; of a river or channel, designated as right or left as it would appear facing downstream. (2) An elevation of the sea floor of large area, located on a Continental (or island) Shelf and over which the depth is relatively shallow but sufficient for safe surface navigation; a group of shoals. (3) In its secondary sense, a shallow area consisting of shifting forms of silt, sand, mud, and gravel, but in this case it is only used with a qualifying word such as "sandbank" or "gravelbank." [14]

A plateau of any material over which the depth of water is relatively small but sufficient for safe navigation (6 to 100 fathoms) and on which there is no island or Archipelago projecting above the surface of the water. It may act as a support for any secondary formation such as shoals or reefs, which are dangerous to navigation. [36]

BAR. A ridge or mound of sand, gravel, or other unconsolidated material below the high water level, especially at the mouth of a river or estuary, or lying a short distance from and usually parallel to the beach, and which may obstruct navigation. [1]

A submerged or emerged embankment of sand, gravel, or other unconsolidated material built on the sea floor in shallow water by waves and currents. [14]

BAR CHECK. A method of field calibrating the sounding equipment used in hydrographic survey by suspending a bar or disc beneath the transducer at various depths. [10]

BARE ROCK. A rock extending above the datum of mean high water. In the charting of the National Ocean Service, bare rock symbols are used for rocks extending more than one foot above mean high water on the Atlantic coast, and extending more than two feet above mean high water on the Pacific coast. See rock, rock awash, and sunken rock. [15]

BARRIER BEACH. A bar essentially parallel to the shore, the crest of which is above high water. [1]

BARRIER ISLAND. A detached portion of a barrier beach between two inlets. [4]

BARRIER LAGOON. A bay roughly parallel to the coast and separated from the open ocean by barrier islands. Also the body of water encircled by coral islands and reefs, in which case it may be called on atoll lagoon. [14]

BARRIER REEF. A coral reef which roughly parallels land but is some distance offshore, with deeper water adjacent to the land, as contrasted with a Fringing Reef closely attached to the shore. [1]

A Coral Reef fronting the Shore, at some distance from it, and separated from it by a Lagoon or a navigable Channel of moderate Depth. See also Fringing Reef. [17]

A coral reef parallel to and separated from the coast by a lagoon that is too deep for coral growth. Generally, barrier reefs follow the coasts for long distances, and are cut through at irregular intervals by channels or passes. [14]

BAR SCALE. A line or series of lines on a chart, subdivided and labeled with the distances represented on the chart. Also called Graphic Scale. See also Scale. [1]

BASCULE BRIDGE. A single or double leaf span, with the shoreward ends hinged, allowing the span to be elevated vertically.

BASE IMAGE. An image composed of basic map data in varying degrees of completion, upon which additional data may be surprinted, scribed, or otherwise applied. Usually controls the position of any super-imposed image. [28]

BASE LINE. (1) (geodesy) a surveyed line established with more than usual care to which surveys are referred for coordination and correlation. Base lines are established for specific purposes; the more important ones are defined below.

(2) (triangulation) the side of one of a series of connected triangles, the length of which is measured to a prescribed standard of accuracy and from which the lengths of the sides of the other triangles are obtained by computation. Base lines in triangulation are classified according to the character of the work they are intended to control; the instruments and methods used in their measurement assure that the prescribed standards of accuracy are met. [39]

(3) The reference used to position limits of the territorial sea and the contiguous zone. Source data from which the United States base line is determined are the mean low water line on the Atlantic and gulf coasts and the mean lower low water line on the Pacific coast, Alaska, and Hawaii. The United Nations Conference on the Law of the Sea defined the low water line along a coast, as shown on large-scale charts of the coastal State (country) to be the base line for determining the limit of the territorial sea. (2) One side of a series of connected triangles, the length of which is measured with prescribed accuracy and precision, and from which the lengths of the other triangle sides are obtained by computation. Important factors in the accuracy and precision of base measurements are the use of standardized invar tapes, controlled conditions of support and tension, and corrections for temperatures, inclination, and alinement. Base lines in triangulation are classified according to the character of the work they are intended to control, and the instruments and methods used in their measurement are such that prescribed probable errors for each class are not exceeded. These probable errors, expressed in terms of the lengths, are as follows: first order, 1 part in 1,000,000; second order, 1 part in 500,000; and third order, 1 part in 250,000. (4) Usually baseline. Of a radionavigation system, the geodetic line between two stations operating in conjunction for the determination of a line of position. [1]

BASELINE DELAY. The time interval needed for the signal from a master station of a hyperbolic radionavigation system to travel the length of the baseline, introduced as a delay between transmission of the master and slave (or secondary) signals to make it possible to distinguish between the signals and to permit measurement of time differences. [1]

BASELINE EXTENSION. The extension of the baseline in both directions beyond the transmitters of a pair of radio stations operating in conjunction for determination of a line of position. [1]

BASIC SURVEY. A hydrographic survey so complete and thorough that it does not need to be supplemented by other surveys, and is adequate to supersede, for charting purposes, all prior hydrographic surveys of the area. [29]

BASIN. A large depression of a general circular, elliptical, or oval shape; the drainage or catchment area of a stream or lake; a depression of the sea floor more or less equidimensional in form (when the length is much greater than the width, the feature is a trough). [4]

(1) A depression of the sea floor more or less equidimensional in plan view and of variable extent. (2) An area of water surrounded by quay walls, usually created or enlarged by excavation, large enough to receive one or more ships for a specific purpose. See also Graving Dock, Half-tide Basin, Non-tidal Basin, Scouring Basin, Tidal Basin, Turning Basin. (3) An area of land which drains into a lake or sea through a river and its tributaries. (4) A nearly land-locked area of water leading off at inlet, firth, or sound. [1]

(5) A depression in the sea bottom, of a roughly round outline. (2) An enclosed area of water surrounded by quay walls constructed to provide means for the transfer of cargoes from ship to quay, warehouses, and other storage places or to river craft lying alongside and vice versa. The term dock should, strictly speaking, be applied only to wet docks closed by gates. It is, however, commonly and popularly employed in a wider sense. [36]

Sheltered body of water available for port operations connecting either with the sea or with an outer port or with another basin, sometimes by means of a lock or passage.

Abbreviation of dry dock.

In geography, the tract of country drained by a river and its tributaries or which drains into a particular lake or sea.

In oceanography, a depression of the sea floor more or less equidimensional in form and of very variable extent. [17]

BASIN, TIDAL. A basin affected by tides, particularly one in which water can be kept at a desired level by means of a gate. [17]

BATHYMETRIC CHART. A topographic map of the ocean floor, or the bed of a lake. [21]

A topographic chart of the bed of a body of water, or a part of it. Generally, bathymetric charts show depths by contour lines and gradient tints. [1]

BATHYMETRY. The determination of ocean depths. The general configuration of sea floor as determined by profile analysis of depth data. [17]

Submarine topography, esp. as applied to oceanographic studies. [4]

BAY. (General). An indentation of the coast; an embayment; a subordinate adjunct to a larger body of water; a body of water between and inside of two headlands.
(According to Geneva Convention). A well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain landlocked waters and constitute more than a mere curvature of the coast. The area of such an indentation must be as large as, or larger than the semicircle whose diameter is a line drawn across the mouth of the indentation. [3]

(1) In general, an unmistakable and pronounced indentation of a coast. According to the Geneva Convention of 1958, a bay is "a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain landlocked waters and constitute more than a mere indentation of a coast. An indentation should not be regarded as a bay, however, unless its area is as large as, or larger than, that of a semi-circle whose diameter is a line drawn across the mouth (i.e., from headland to headland, or from extremity to extremity) of that indentation." For the purpose of measurement, the area of an indentation is determined between the low-water mark around the shore of the indentation and a line joining the low-water marks at its natural entrance points. (2) The body of water contained within a bay as defined in (1) above. [39]

A recess in the shore, or an inlet of a sea or lake between two capes or headlands, not as large as a gulf but larger than a cove. [4]

BAY DELTAS. Deltas formed at the mouths of streams which discharge into bays or estuaries. Their advance toward the bay mouths often extinguishes lagoons behind bay bars or

completely fills open bays, thus simplifying the shoreline. When the delta forms at the head of the bay, it is a bay-head delta. [12]

BAYMOUTH BAR. A bar extending partly or entirely across the mouth of a bay. [14]

BAYOU. A minor, sluggish waterway or estuarial creek, generally tidal or with a slow or imperceptible current, and with its course generally through lowlands or swamps, tributary to or connecting with other bodies of water. Various specific meanings have been implied in different parts of the southern United States. Sometimes called slough. [1]

A widely (and loosely) used term along the Gulf Coast, most often applied to a creek or small river with tortuous course and sluggish current; a lake, often in an abandoned stream channel; a connecting channel. [4]

BEACH. The zone of unconsolidated material that extends landward from the low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves). A beach includes foreshore and backshore. The beach along the margin of the sea may be called seabeach. Also called strand, especially when the beach is composed of sand. See also Tidelands. [1]

BEACH BERM. A nearly horizontal part of the beach or backshore formed by the deposit of material by wave action. Some beaches have no berms, others have one or several. [14]

BEACH FACE. The section of the beach normally exposed to the action of the wave uprush. The foreshore of a beach. (Not synonymous with Shoreface). [14]

BEACON. A lighted or unlighted aid to navigation attached to the earth's surface. (Lights and daybeacons both constitute "beacons.") [37]

A light or electronic source which emits a distinctive or characteristic signal used for the determination of bearings, courses, or location. [13]

A fixed artificial navigation mark. [1]

BEAM COMPASS. A drafting instrument for drawing circles with a long radius. The point and the pen, or pencil tip, are separate units, mounted to slide and clamp on a long bar or "beam" so that the distance between them is equal to the desired radius. [26]

BEARING. The horizontal direction of a line of sight between two objects on the surface of the earth. [37]

(1) In general, the horizontal angle between a line from the observer to a given point, and a line from the observer along a specified direction (such as north). Various conventions can apply. For example, the bearing can be determined both clockwise or counterclockwise from the specified direction, so that the bearing does not exceed 180°. (2) The horizontal angle that a line makes with the meridian of reference adjacent to the quadrant in which the lines lies. Bearings are classified, according to the reference meridian used, as true bearings, magnetic bearings, or grid bearings. A bearing is identified by naming the end of the

meridian (north or south) from which it is reckoned and the direction (east or west) of that reckoning. Thus, a line in the northeast quadrant making an angle of 50° with the meridian will have a bearing of N. 50° E. In most survey work, it is preferable to use azimuths rather than bearings. [39]

The horizontal direction of one terrestrial point from another, expressed as the angular distance from a reference direction. It is usually measured from 000° at the reference direction clockwise through 360°. The terms Bearing and Azimuth are sometimes used interchangeably, but in navigation the former customarily applies to terrestrial objects and the latter to the direction of a point on the celestial sphere from a point on the earth. A bearing is often designated as true, magnetic, compass, grid, or relative as the reference direction is true, magnetic, compass, or grid north, or heading, respectively. The angular distance between a reference direction and the initial direction of a great circle through two terrestrial points is called great-circle bearing. The angular distance between a reference direction and the rhumb line through two terrestrial points is called rhumb or Mercator bearing. A bearing differing by 180°, or one measured in the opposite direction, from a given bearing is called a reciprocal bearing. The maximum or minimum bearing of a point for safe passage of an off-lying danger is called danger bearing. A relative bearing of 045° or 315° is sometimes called a four-point bearing. Successive relative bearings (right or left) of 45° and 90° taken on a fixed object to obtain a running fix are often called bow and beam bearings. Two or more bearings used as intersecting lines of position for fixing the position of a craft are called cross bearings. The bearing of a radio transmitter from a receiver, as determined by a radio direction finder, is called a radio bearing. A bearing obtained by radar is called a radar bearing. A bearing obtained by visual observation is called a visual bearing. A constant bearing maintained while the distance between two craft is decreasing is called a collision bearing. [1]

BEARING ANGLE. Bearing measured from 0° at the reference direction clockwise or counterclockwise through 90° or 180°. It is labeled with the reference direction as a prefix and the direction of measurement from the reference direction as a suffix. Thus, bearing angle N 37° W is 37° west of north, or bearing 323°. [1]

BEAUFORT WIND SCALE. A system of estimating and reporting wind speeds, devised in the early nineteenth century (1806) by Admiral Beaufort of the British Navy. It was originally based on the effects of various wind speeds on the amount of canvas that a full-rigged frigate of the period could carry, but has since been modified and modernized. In its present form for international meteorological use it equates (a) Beaufort force (or Beaufort number), (b) wind speed, (c) descriptive term, and (d) visible effects upon land objects or sea surface. [12]

BED. The ground upon which a body of water rests. The term is usually used with a modifier to indicate the type of water body, as river bed or sea bed. See also Bottom. [1]

BEGINNING-OF-TAPE MARKER. (1) (ISO) A marker on a magnetic tape used to indicate the beginning of the permissible recording area, e.g., a photo reflective strip, a transparent section of tape. (2) Contrast with end-of-tape marker. [20]

BELL. A device for producing a distinctive sound by the vibration of a hollow, cup-shaped metallic vessel which gives forth a ringing sound when struck. If the signal is sent through the water, the device is called a submarine bell. [1]

BELL BUOY. A steel float surmounted by a short skeleton tower in which the bell is fixed. Most bell buoys are sounded by the motion of the buoy in the sea. In a few buoys, the bells are struck by compressed gas or electrically operated hammers. [1]

BENCH. (1) A level or gently sloping erosion plane inclined seaward. (2) A nearly horizontal area at about the level of maximum high water on the sea side of a dike. [14]

BENCH MARK. A relatively permanent, natural or artificial, material object bearing a marked point whose elevation above or below an adopted surface (datum) is known. Sometimes written "benchmark". Usually designated a BM, such a mark is sometimes further qualified as a permanent bench mark to distinguish it from a temporary bench mark. [39]

A fixed physical object used as reference for a vertical datum. A tidal bench mark is one near a tide station to which the tide staff and tidal datums are referred. A primary tidal bench mark is the principal (or only) mark of a group of tidal bench marks to which the tide staff and tidal datums are referred. The standard tidal bench mark of the National Ocean Survey is a copper or aluminum alloy disk 3½ inches in diameter containing the inscription National Ocean Survey together with other individual identifying information. A geodetic bench mark identifies a surveyed point in the National Geodetic Vertical Network. Geodetic bench mark disks contain the inscription VERTICAL CONTROL MARK - NATIONAL GEODETIC SURVEY with other individual identifying information. Bench mark disks of either type may, on occasion, serve simultaneously to reference both tidal and geodetic datums. Numerous bench marks, both tidal and geodetic, still bear the inscription U.S. Coast and Geodetic Survey. [1]

BERM. The nearly horizontal portion of a beach or backshore having an abrupt fall and formed by deposition of material by wave action, and marks the limit of ordinary high tides. [12]

BERTH. The place where a vessel lies when tied up or anchored. [4]

A place for securing a vessel. [1]

BIANGLE SCREEN. A photographic negative containing a composite of two dot screens, with the screen angles oriented 30° apart. These screens are used to print tones of color for chart features with thin lines. [10]

BIFURCATION. A division of a channel into two branches, a fork. [37]

BIFURCATION BUOY. A buoy which, when viewed from a vessel approaching from the open sea, or in the same direction as the main stream of flood current, or in the direction established by appropriate authority, indicates the place at which a channel divides into two. See also Junction Buoy. [1]

BIGHT. A bend or curve; a bend in a coast forming an open bay; a small open bay formed by an indentation in the coast; a minor feature which affords little protection for vessels. [4]

BINARY. (1) A numbering system based on 2's rather than 10's which uses only the digits 0 and 1 when written. (2) A characteristic, property, or condition in which there are but two possible alternatives; e.g., the binary number system using 2 as its base and using only the digits zero (0) and one (1). [34]

BLEEDING EDGE. An edge of a map to which printed Detail extends after the paper has been trimmed. Also known as Bleeding Margin Format, Bleed, Extended Color. [21]

BLOCK. (1) (ISO) A string of records, a string of words, or a character string of words, or a character string, formed for technical or logic reasons to be treated as an entity. (2) A set of things, such as words, characters, or digits, handled as a unit. (3) A collection of contiguous records recorded as a unit. Blocks are separated by interblock gaps and each block may contain one or more records. (4) A group of bits, or n-ary digits, transmitted as a unit. An encoding procedure is generally applied to the group of bits or n-ary digits for error-control purposes. (5) See control block, program block. [20]

(1) A collection or group of words, records, or characters which are handled as a single unit. In real-time systems, blocks are used to describe input/output or working storage areas in main storage. A file storage block is often called a "physical record." (2) The set of locations or tape positions in which a block of words, as defined above, is stored or recorded. (3) A circuit assemblage which functions as a unit, e.g., a circuit building block of standard design, and the logic block in a sequential circuit. [34]

BLOCK OUT. To mask or paint over with opaque the transparent portions of a negative that should not image the plate. Opaquing is often referred to as "blacking out." [30]

The deletion of areas or images on a scribed or photographic negative by opaquing or other means. Sometimes used to indicate an interposed negative or positive employed as a mask. See Mask. [28]

BLOW UP. Enlarge photographically. [30]

BLUELINE. A nonreproducible blue image or outline usually printed photographically on paper or plastic sheeting, and used as a guide for drafting, stripping, or layout. Also called blind image. [10]

BLUE SENSITIVE. A term applied to films and plates which are sensitive principally to blue and ultraviolet light and have little or no sensitivity to light or other colors. [28]

BLUE TINT CURVE. A blue tint is shown in the water areas to the curve which is considered the danger curve for vessels expected to use that particular chart. [29]

BLUFF. A bold, steep headland or promontory. A high, steep bank or low cliff. [4]

BLUFFS AND CLIFFS. A rigorous definition of either a bluff or cliff, or a precise distinction

between the two, is very difficult if not impossible. A feature that is called a cliff in one area is called a bluff in another. However, most references describe a cliff as a near vertical surface composed of rock. Other promontories with steep surfaces, but not exhibiting both the near vertical face and the rock structures should be called bluffs. [31]

BLUNDER. A mistake. A blunder is not an error, though a small blunder may remain undetected in a series of observations and have the effect of an error in determining a result. Examples of blunders are reading a horizontal circle incorrectly by an even degree, neglecting to record a tape length in a measured traverse, and reversing numerals in recording an observation. [26]

BOARD ON GEOGRAPHIC NAMES. An agency of the U.S. Government, first established by Executive Order in 1890 and currently functioning under Public Law 242-80, July 25, 1947. Twelve departments and agencies enjoy Board membership. Conjointly with the Secretary of the Interior, the Board provides for "uniformity in Geographic nomenclature and orthography throughout the Federal Government." It develops policies and romanization systems under which names are derived and its standardizes geographic names for use on maps and in textual materials. [1]

BOAT. Means any vessel manufactured or used primarily for noncommercial use; leased, rented, or chartered to another for the latter's noncommercial use; or engaged in the carrying of six or fewer passengers. [2]

BOAT HARBORS AND MARINAS. Areas of sheltered water, generally within harbors or ports, set aside for the use of small craft, usually with moorings, buoys, and, in the case of marinas, berthing facilities. [16]

BOATHOUSE. A building at or near a shore for storage of boats. [35]

BOAT SHEET. The work sheet used by the hydrographer in the field for plotting the details of a hydrographic survey as it progresses. It is similar to the smooth sheet, with projection lines, control stations, shoreline, and proposed sounding lines. Corresponds to what was termed in early instructions for hydrographic work as "diagram," "sounding sheet," and "working sheet." See Smooth Sheet. [3]

BOG. A small open marsh which yields under the foot. [4]

BOLD COAST. A prominent land mass that rises steeply from the sea. [14]

BOLLARD. A post (usually steel or reinforced concrete) firmly secured on a wharf, quay, etc., for mooring vessels by means of lines extending from the vessel and secured to the post. [1]

BOOM. A floating barrier of timber used to protect a river or harbor mouth or to create a harbored area for storage purposes. Also called log boom. [17]

BORDER BREAK. A cartographic technique used when it is required to extend cartographic detail of a map or chart beyond the neatline into the margin. This technique eliminates the necessity of producing an additional sheet. Also called Blister. [1]

BORDER OF CHART. The neatline defining the limits of the area charted. [17]

BORE. A very rapid rise of the tide in which the advancing water presents an abrupt front of considerable height. Bores generally occur in shallow estuaries where the range of tide is large. [15]

BOTTOM. The ground under a body of water. The terms bed, floor, and bottom have nearly the same meaning, but bed refers more specifically to the whole hollowed area supporting a body of water, floor refers to the essentially horizontal surface constituting the principal level of the ground under a body of water, and bottom refers to any ground covered with water. [1]

BOTTOM CHARACTERISTICS. Designations used on surveys and nautical charts to indicate the consistency, color, and classification of the sea bottom. Also called nature of the bottom, character of the bottom. [1]

BOTTOM LAND. Lowland formed by alluvial deposit along a stream or in a lake basin; a flood plain. [4]

BOTTOM, NATURE OF. The feature of the Bottom including the material of which it is composed and its physical characteristics. Also called character (or characteristics) of the bottom, or quality of the bottom. [17]

BOULDER. A more or less rounded rock, larger than a cobblestone and as much as 10 feet or more in diameter. [4]

A detached water-rounded stone more than 256 millimeters in diameter, i.e., larger than a man's head. [1]

Any detached and rounded mass of rock, usually more than 10 inches and as much as 10 feet or more in diameter. [15]

BOUNDARY LINE. A line separating two areas. In specific cases, the word "boundary" is often omitted, as in State Line; or the word line is omitted, as in International Boundary, county boundary, etc. The term boundary line is used to specify boundaries between political territories, as in State boundary lines between two States. A boundary line between privately owned parcels of land is, by preference, called a property line, or if a line of the U.S. public-land surveys, is given the designation generally used in that survey system, such as section line, township line, etc. [39]

BOUNDING MERIDIAN. A Meridian which is coincident with a part of the neat line. [21]

BOUNDING PARALLEL. A Parallel which is coincident with a part of the neat line. [21]

BOWDITCH. Popular title for Pub. No. 9, American Practical Navigator. [1]

BOXING THE COMPASS. Stating in order the names of the points (and sometimes the half and quarter points) of the compass. [1]

BRANCH. A creek or brook, as used locally in southern States. Also used to designate one of the bifurcations of a stream, as a fork. [4]

BREAKER. A wave breaking on the shore, over a reef, etc. Breakers may be roughly classified into three kinds, although the categories may overlap: spilling breakers break gradually over a considerable distance; plunging breakers tend to curl over and break with a crash; and surging breakers peak up, but then instead of spilling or plunging they surge up on the beach face. The French word "brisant" is also used for the obstacle causing the breaking of the wave. [17]

A wave which breaks, either because it becomes unstable when it reaches shallow water, the crest toppling over or "breaking", or because it dashes against an obstacle. Instability is caused by an increase in wave height and a decrease in the speed of the trough of the wave in shallow water. The momentum of the crest, often aided by the wind, causes the upper part of the wave to move forward faster than the lower part. The crest of a wave which becomes unstable in deep water and topples over or "breaks" is called a Whitecap. [1]

BREAKWATERS. A breakwater is a structure protecting a shore area, harbor, anchorage, or basin from waves. A floating breakwater is a contrivance consisting of floating materials connected by mooring chains or cables attached to anchors or stone blocks in such a manner as to form a basin within which vessels may be protected from the violence of the waves. A breakwater may be attached to or separated from the shore. [31]

Anything which breaks the force of the sea at a particular place, thus forming protection for vessels. Often an artificial embankment built to protect the entrance to a harbor, or to form an artificial harbor. See also Jetty. [1]

A structure built in the water to break the force of the waves in order to provide shelter for vessels and to protect a harbor or anchorage. [4]

BRIDGE. The term bridge means a lawful bridge over navigable waters of the United States, including approaches, fenders, and appurtenances thereto, which is used and operated for the purpose of carrying railroad traffic, or both railroad and highway traffic, or if a State, county, municipality, or other political subdivision is the owner or joint owner thereof, which is used and operated for the purpose of carrying highway traffic. [2]

BRIDGE BOOKS. The common term for "Bridges over the Navigable Waters of the United States," published by the Corps of Engineers, U.S. Army. The 1961 edition is in four parts: Part 1, Atlantic Coast; Part 2, Gulf and Mississippi River System; Part 3, Great Lakes; and Part 4, Pacific Coast. In 1967 the U.S. Coast Guard assumed jurisdiction of bridges over navigable waters. [15]

BRIDGING. A photogrammetric method of establishing and adjusting control between bands of existing ground control, both horizontally and vertically. The term is usually qualified as horizontal or vertical according to its primary purpose. Also called horizontal bridging; horizontal/vertical bridging; vertical bridging. [10]

BROADCAST NOTICE TO MARINERS. Designed to provide important marine information via radio broadcasts. [37]

BROOK. A stream of less length and volume than a creek, as used locally in the Northeast. Generally, one of the smallest branches or ultimate ramifications of a drainage system. [4]

BUG. A mistake in a program, or an equipment malfunction. [22]

BUILDINGS. Buildings exist in all sizes and shapes and exhibit various degrees of prominence. Those of true landmark value are discussed under "Landmarks." Many others, however, are sufficiently prominent so as to aid the mariner in becoming oriented, especially in harbor areas. These are buildings such as large warehouses, factories, maintenance facilities, etc., that will aid the mariner, for example, in identifying a particular berth. [31]

BUILT-UP AREA. An area where the buildings are so close together that for cartographic clarity a tint or hatching is used to indicate the extent of the area. Landmark buildings are usually depicted within the area. Cartographic agencies usually define by scale the extent of congestion required before the area tint or hatching is used, as well as the minimum dimensions of such areas or of clear areas within tinted or hatched areas. [35]

BULK CARGO. Usually a homogeneous cargo stowed in bulk, i.e., loose in the hold and not enclosed in any container such as boxes, bales, bags, etc. Bulk cargos may be free-flowing articles (such as oil, grain, or ore) which can be pumped or run through a chute or handled by dumping, or articles that require mechanical handling (such as coke, bricks, or pig iron). [15]

BULKHEAD. A structure or partition to retain or prevent sliding of the land. A secondary purpose is to protect the upland against damage from wave action. [14]

A bulkhead is a structure or partition to retain or prevent sliding of the land. A secondary purpose is to protect the upland against damage from wave action. Bulkheads are frequently filled behind thereby increasing the utility of the adjacent land area. [31]

BUOY. A floating object, other than a lightship, moored or anchored to the bottom and an aid to navigation. Buoys may be classified according to shape, as spar, cylindrical or can, conical, nun, spherical, barrel, dan, or pillar buoy. They may also be classified according to the color scheme, as a red, black, or checkered buoy. A buoy fitted with a characteristic shape at the top to aid in its identification is called a topmark buoy. A sound buoy is one equipped with a characteristic sound signal, and may be further classified according to the manner in which the sound is produced, as a bell, gong, horn, trumpet, or whistle buoy. A lighted buoy is one with a light having definite characteristics for detection and identification during darkness. If the light is produced by gas, it may be called a gas buoy. A buoy equipped with a marker radiobeacon is called a radiobeacon buoy. A buoy with equipment for automatically transmitting a radio signal when triggered by an underwater sound signal is called a sonobuoy. A combination buoy has more than one means of conveying intelligence; it may be called a lighted sound buoy if it is a lighted buoy provided with a sound signal. Buoys may be classified according to location, as channel, mid-channel, middle ground, turning fairway, bifurcation, junction, or sea buoy. A bar buoy marks the location of a bar. A buoy

marking a hazard to navigation may be classified according to the nature of the hazard, as obstruction, wreck, telegraph, cable, fish net, dredging, or spoil ground buoy. Buoys used for particular purposes may be classified according to their use, as anchor, anchorage, quarantine, mooring, warping, swinging marker, station, watch, or position buoy. A light-weight buoy especially designed to withstand strong currents is called a river buoy. An ice buoy is a sturdy one used to replace a more easily damaged buoy during a period when heavy ice is anticipated. [1]

A floating object moored to the bottom in a particular (charted) place, as an Aid to Navigation or for other specific purposes. Navigational buoys may be classified according to: (a) Their shape, appearance, or construction, such as barrel, Can, cask, conical, cylindrical, dan, keg, nun, pillar, spar, spherical, or topmark buoy; (b) their color, such as black, checkered, green, red buoy; (c) their location, such as bifurcation, fairway, junction, mid-channel, middle-ground, or turning buoy; (d) the various kinds of hazards or dangers to navigation they mark, such as bar, isolated danger, fish trap, obstruction, spoil ground, telegraph or wreck buoy; (e) their particular purpose or use, such as anchor, anchorage, compass adjustment, dredging, farewell (or landfall), marker, quarantine, station (or watch), or warping buoy. [17]

BUOYAGE. A system of buoys. One in which the buoys are assigned shape, color, and number distinction in accordance with location relative to the nearest obstruction is called a cardinal system. One in which buoys are assigned shape, color, and number distinction as a means of indicating navigable waters is called a lateral system. See also IALA Maritime Buoyage System. [1]

BUREAU OF LIGHTHOUSES. A federal agency under the Department of Commerce, created in 1910, to replace the Lighthouse Board. It was placed under the authority of the Commissioner of Lighthouses and was responsible for the construction, operation and upkeep of land structures and floating equipment on the United States Coast, and the Great Lakes. The service outside Washington was divided into 19 districts, each under the charge of a lighthouse inspector. In 1938 the Bureau of Lighthouses was transferred to the Treasury Department and placed under the U.S. Coast Guard. [36]

BUTTE. A lone hill, especially one with steep or precipitous sides. [4]

BUREAU OF LAND MANAGEMENT. The Bureau of Land Management (BLM) was established July 16, 1946, by the consolidation of the General Land Office (created in 1812) and the Grazing Service (formed in 1934). This was done in accordance with the provisions of sections 402 and 403 of Presidential Reorganization Plan 3 of 1946 (5 U.S.C. App.). The Federal Land Policy and Management Act of 1976 (90 Stat. 2743) enacted into law on October 21, 1976, repealed and replaced many obsolete or overlapping statutes. It provides a basic mission statement for BLM and establishes policy guidelines and criteria for the management of public lands and resources administered by the Bureau.

The Bureau's basic organization consists of a headquarters in Washington, D.C.; a Service Center in Denver, Colorado, and a Fire Center in Boise, Idaho, that have bureau wide support responsibilities; and a field organization of State, district, and resource area offices. The Bureau also utilizes a system of Advisory Councils to assist in the development of management plans and policies. [27]

BYTE. A sequence of adjacent binary digits operated upon as a unit and normally used to represent a character. This is the basic unit of storage capacity in a so-called "byte-oriented" data processing machine. Contrast with "word." [22]

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C

CABLE. A British unit of distance. A cable's length may be assumed to be equal to the tenth part of a nautical mile, 100 fathoms, or 200 yards. [15]

CADASTRAL MAPPING. The mapping of property boundaries, particularly to record the limitation of title or for the assessment of taxation. In the United States of America the term "cadastral" is associated particularly with surveys and re-surveys of the public lands. The term may also be applied properly to corresponding surveys outside the public lands although such surveys are generally described as land surveys. [21]

CAIRN. A mound of rough stones or concrete, particularly one serving or intended to serve as a landmark. The stones are customarily piled in a pyramidal or beehive shape. [1]

CAISSON. A watertight gate for a lock, basin, etc. [1]

A Caisson is a steel structure which either floats or slides into place to close the entrance to a dry dock, lock or non-tidal basin. [16]

CALL LETTERS. Identifying letters, sometimes including numerals, assigned by competent authority to a radio station. In the United States such identification is assigned by the Federal Communications Commission. [16]

CANAL. (1) An artificial waterway for navigation. (2) A long, fairly straight natural channel with steep sloping sides. (3) Any watercourse or channel. (4) A sluggish coastal stream, as used locally on the Atlantic coast of the U.S. [1]

An artificial watercourse. A long narrow arm of the sea extending inland between islands, or between islands and the mainland. [17]

An artificial watercourse cut through a land area for such uses as navigation and irrigation. [14]

CAN BUOY. An unlighted buoy of which the upper part of the body (above the waterline), or the larger part of the superstructure, has the shape of a cylinder or nearly so. Also called cylindrical buoy. [1]

CANDLEPOWER. Luminous intensity expressed in candles. Also written as two words. [17]

CANOE CHARTS. This is a U.S. National Ocean Service map series of the Minnesota-Ontario Border Lakes. Most Canoe Charts do not show hydrography. They are intended to portray the general shape and size of these lakes and to provide information of interest to campers and boaters who must portage between the lakes. [29]

CANYON. On the sea floor, a relatively narrow, deep depression with steep sides, the bottom of which generally has a continuous slope. [1]

A deep gorge, ravine or valley having steep sides. [17]

A relatively narrow, deep depression with steep side slopes, the bottom of which grades continuously downward. [4]

CAPE. A relatively extensive land area jutting seaward from a continent, or large island, which prominently marks a change in or interrupts notably the coastal trend. [1]

CAPTAIN OF THE PORT. "Captain of the Port" as used in this part, means the officer of the Coast Guard, under the command of a District Commander, so designated by the Commandant for the purpose of giving immediate direction to Coast Guard law enforcement activities within his assigned area. In addition, the District Commander shall be Captain of the Port with respect to remaining areas in his District not assigned to officers designated by the Commandant as Captain of the Port. [2]

CARDINAL MARK. See IALA Maritime Buoyage System. [1]

CARDINAL POINT. Any of the four principal directions; north, east, south, or west. Directions midway between cardinal points are called intercardinal points. [1]

CARDINAL SYSTEM. A buoyage system generally used to indicate dangers where the coast is flanked by numerous islands, rocks, and shoals as well as to indicate dangers in the open sea. In this system the bearing (true) of the mark from the danger is indicated to the nearest cardinal point.

A system of buoyage in which the aids are assigned shape, color, and number distinction in accordance with location relative to the nearest obstruction. The cardinal points delineate the sectors for buoy location. [17]

CARGO OF PARTICULAR HAZARD. "Cargo of particular hazard" means any of the following:(a) Class A explosive as defined in 46 CFR 146.10-7 and 49 CFR 173.53. (b) Oxidizing material or blasting agent for which a permit is required under 49 CFR 176.415. (c) Large quantity radioactive material, as defined in 49 CFR 173.389(b), or Fissle Class III shipments of fissile radioactive material, as defined in 49 CFR 173.389(a)(3). (d) The following cargoes when carried in Bulk: See 33 CFR 126.10(2). [2]

CARSE. A low, fertile river bottom. (Scot. origin.) [4]

CARTESIAN COORDINATES. Magnitudes defining a point relative to two intersecting lines, called AXES. The magnitudes indicate the distance from each axis, measured along a parallel to the other axis. If the axes are perpendicular, the coordinates are rectangular; if not perpendicular, they are oblique coordinates. [1]

CARTESIAN COORDINATE SYSTEM. The most common type of coordinate system in which two straight axes perpendicular to each other, usually called x- and y-axis, are used. [22]

CARTOGRAPHER. One who practices Cartography particularly a member of the profession regularly concerned with any stage in the evaluation, compilation, design or draughting of a map. [21]

Person employed in drawing and constructing charts or maps. The art and science of expressing graphically, by maps and charts, the known physical features of the earth, or of another celestial body. Often includes the works of man and his varied activities. [17]

CARTOGRAPHIC (DIGITAL) DATA BANK. The same as cartographic data base, except when a distinction between data base and data bank is made. [22]

CARTOGRAPHIC (DIGITAL) DATA BASE. A data base containing cartographic information structured according to cartographic data user needs which involves storing, retrieving and manipulation of cartographic data. [22]

CARTOGRAPHIC DIGITIZING/PLOTTER SYSTEM. Digitizer/plotter system precise and accurate enough to be used for cartographic applications. See also Accuracy. [22]

CARTOGRAPHIC FEATURE. A term applied to the natural or cultural items shown on a map or chart. The three main categories are: "point feature," "line feature" and "area feature." [22]

CARTOGRAPHIC LICENSE (USGS). The freedom to modify manuscript information in order to improve the clarity of the map. [26]

CARTOGRAPHY. The art, science and technology of making maps, together with their study as scientific documents and works of art. In this context maps may be regarded as including all types of maps, plans, charts and sections, three-dimensional models and globes representing the Earth or any celestial body at any scale. [21]

CASCADE. A fall of water over steeply sloping rocks, usually comparatively small or one of a series. [4]

CATARACT. A waterfall, usually larger than a cascade, over a precipice. [4]

CATHODE-RAY TUBE. A vacuum tube in which the instantaneous position of a sharply focused electron beam, deflected by means of electrostatic or electromagnetic fields, is indicated by a spot of light produced by impact of the electrons on a fluorescent screen at the end of the tube opposite the cathode. [1]

CATHODE RAY TUBE DISPLAY. Display device utilizing a CRT to generate the image, or the image generated by a CRT. See Display. [22]

CATWALK. See Fore-and-Aft Bridge. [36]

CAUSEWAY. A raised way, as for a road, across wet ground or water. Viaduct. [1]

A causeway is a raised roadway of solid structure built primarily to provide a route across wet ground or an intertidal area. [16]

CAUTIONARY CHARACTERISTIC. Of a light, a unique characteristic which can be recognized as imparting a special cautionary significance e.g., a quick flashing characteristic phase indicating a sharp turn in a channel. [1]

CAVERN. A large, natural, underground cave or series of caves. Often but not always used to imply largeness or indefinite extent to distinguish from "cave." [4]

CAY (ALSO KAY, KEY). A low, flat island of sand, coral, etc., awash or drying at low water; a term originally applied to the coral islets around the coast and islands of Caribbean Sea. [17]

A key; a comparatively small and low coastal island of sand or coral. Pronounced "key". The spelling "kay" is common in the West Indies. [4]

CEJA. The cliff at a mesa edge; an escarpment. Local in Southwest. [4]

CENTRAL MERIDIAN. (1) The line of longitude at the center of a projection. Generally, the basis for constructing the projection. (2) The longitude of origin at the center of each 6-degree zone of the Universal Transverse Mercator (UTM) grid. The central meridian is arbitrarily numbered 500,000 and is called a false easting. (3) (state plane-coordinate system) The meridian used as the y-axis for computing projection tables for a state coordinate system. The central meridian of the system usually passes close to the center of figure of the area or zone for which the tables are computed. [10]

CENTERLINE CONTROLLING DEPTH. The controlling depth of a waterway which applies only to the center of the waterway; it is usually the result of a reconnaissance-type survey consisting of only a few lines of soundings which do not provide adequate coverage to determine the controlling depth of the entire waterway. [15]

CERRITO (OR CERRILLO). A small hill. Local in Southwest. [4]

CERRO. Hill, highland; ridge. Local in Southwest. [4]

CENTRAL PROCESSING UNIT. (CPU) A unit of a computer that includes the circuits controlling the interpretation and execution of instructions. Synonymous with main frame. [9]

CHAIN. A group of associated stations of a radionavigation system. A LORAN-C chain consists of a master station and two to four secondary stations. [1]

The unit of length prescribed by law for the survey of the public lands of the United States. The chain is equivalent to 66 feet or 4 rods, poles, or perches. Ten square chains equal one acre. [26]

CHANNEL. (1) That part of a body of water deep enough for navigation through an area otherwise not suitable. It is usually marked by a single or double line of buoys and sometimes by ranges. (2) The deepest part of a stream, bay, or strait, through which the main current flows. (3) A name given to certain large straits, as the English Channel. (4) A hollow bed through which water does or may run. (5) A band of radio frequencies within which a radio station must maintain its modulated carrier frequency to prevent interference with stations on adjacent channels. Also called Frequency channel. [1]

The deepest portion of a stream, bay, or strait through which the main volume or current of water flows; the natural bed occupied by a stream of water. [4]

CHANNEL, SEA. A long narrow, U-shaped or V-shaped shallow depression of the sea floor usually occurring on a gently sloping plain or fan. [17]

CHAPP. Chart History and Plotting Parameter file containing identifying information concerning each KAPP in the data base. [29]

CHARACTER. (1) one symbol of a set of elementary symbols such as those corresponding to the keys on a typewriter. The symbols usually include the decimal digital 0 through 9, the letters A through Z, punctuation marks, operation symbols, and any other single symbols which a computer may read, store, or write. (2) The electrical, magnetic, or mechanical profile used to represent a character in a computer, and its various storage and peripheral devices. A character may be represented by a group of other elementary marks, such as bits or pulses. [24]

A letter, digit, or other symbol that is used as part of the organization, control, or representation of data. A character may in turn be represented in a number of different forms, e.g., as graphic symbol, as analog signal, as digital code, etc. [22]

CHARACTERISTIC. (1) The color and shape of a daymark or buoy or the color and period of a light used for identifying the aid. (2) The identifying signal transmitted by a radiobeacon. [1]

The rhythm and period of a light; the morse code signal transmitted by a radiobeacon; the number of blasts and period produced by a sound signal; the morse code letter transmitted by a Racon. Used for identifying the aid. [37]

CHARACTERISTIC COLOR. Of a light, the unique identifying color, e.g., in the U.S. buoyage System, green lights are used only on black buoys or on horizontally banded black and red buoys with the topmost band black. [1]

CHARACTERISTICS OF LIGHT. All particularities of a light, such as color, period, group number, visibility, height above sea level and character. Also called light characteristics. [17]

CHARACTERISTIC PHASE. Of a light, the sequence and length of light and dark periods by which a navigational light is identified, i.e., whether fixed, flashing, interrupted quick flashing, etc. [1]

CHARACTER OF THE BOTTOM. (Also called nature of the bottom). The type of material of which the bottom is composed and its physical characteristics such as hard, sticky, and rough. [12]

CHARGE. To install batteries in an unmanned aid. [37]

CHART AGENT. Business establishments that are under contract with the NOS and that receive discounts for resale of nautical and aeronautical navigational charts and related publications to the general public at retail prices stipulated by the NOS. [29]

CHART, BATHYMETRIC. A topographic map of the bed of the ocean. [8]

Special-purpose map designed for navigation or to present specific data or information. The term chart is applied chiefly to maps made primarily for nautical and aeronautical navigation, and to maps of the heavens, although the term is sometimes used to describe other special-purpose maps. [25]

CHART DATUM. The datum to which soundings on a chart are referred. It is usually taken to correspond to a low-water elevation, and its depression below mean sea level is represented by the symbol Z. See Datum. [7]

(Also called Sounding Datum). The tidal datum used on nautical charts for referencing the soundings (depth units). See Tidal Datum. [3]

(or datum, datum plane, hydrographic datum plane of reference, reference plane, tidal datum). The permanently established surface from which soundings or tide heights are referenced (usually low water). The surface is called a tidal datum when referred to a certain phase of the tide. In order to provide a factor of safety, some level lower than mean sea level is generally selected, such as mean low water or mean lower low water. [12]

CHART EVALUATION SURVEY. The Chart Evaluations Surveys (CES) program is designed to: (1) Resolve all deficiencies reported or discovered. (A deficiency is defined as charted information that can be made more complete through field examination, or information which should be charted but is not.) (2) Evaluate the adequacy/accuracy of hydrographic information on existing charts. (3) Verify or revise information published in the appropriate Coast Pilot. (4) Conduct user evaluation and public relations efforts to provide an awareness of NOS products and obtain user input. [5]

CHARTED VISIBILITY. The extreme distance, shown in numbers on a chart, at which a navigational light can be seen. This may be the geographic range when limited by the curvature of the earth and the heights of the light and the observer or the luminous range when limited only by the intensity of the light, clearness of the atmosphere, and sensitiveness of the observer's eyes. [29]

CHART, ISOGONIC. Chart showing magnetic declination with isogonic lines and the annual rate of change in declination with isoporic lines. [25]

CHARTLET. (1) A small chart, such as one showing the coverage area of a Loran rate, with the distribution of its lines of position, corrections to be applied to readings, location and identification of transmitters, etc. (2) A corrected reproduction of a small area of a nautical chart which is pasted to the chart for which it is issued. These chartlets are disseminated in Notice to Mariners when the corrections are too numerous or of such detail as not to be feasible in printed form. Also called Block, Block Correction, Chart Amendment Patch. [1]

CHART LETTERS AND BLUEPRINTS. The terms chart letter and blueprint are designations applied to source documents received by the Marine Chart Branch. These documents may originate from within or from outside NOS. The physical size of the document determines whether it is entered as chart letter or blueprint. [32]

CHART MAINTENANCE PRINT. A chart maintenance print is an annotated copy of a shoreline map, a revision print, a revised topographic map, a photogrammetrically revised chart, or other graphic generated by the Photogrammetry Branch, showing the differences between that document and the latest edition of the largest scale nautical chart of the area. [32]

CHART, MARSDEN. A global chart divided into quadrangles (Marsden squares), each extending 10° in latitude and 10° in longitude, which may be subdivided further into quarters, or into 1° quadrangles. The Marsden chart commonly has a number entered into each subdivision. The numbers indicate some average characteristic of the ocean or atmosphere in the region covered by that subdivision. For example, a Marsden chart of sea-state can show, in each quadrangle, the average, or other characteristic, height of the waves in the corresponding region. [39]

CHART, MERCATOR. A chart on the Mercator projection. This is the chart commonly used for marine navigation. In Mercator chart, a rhumb line is a straight line. [17]

CHART, NAUTICAL. A chart specifically designed to meet the requirements of marine navigation, showing depths of water, nature of bottom, elevations, configuration and characteristics of coast, dangers and aids to navigation. Also called marine chart, hydrographic chart, or simply chart. [17]

Representation of a portion of the navigable waters of the earth and adjacent coastal areas on a specified map projection, and designed specifically to meet requirements of marine navigation. Included on most nautical charts are: depths of water, characteristics of the bottom, elevations of selected topographic features, general configuration and characteristics of the coast, the shoreline usually the mean high water line), dangers, obstructions and aids to navigation, limited tidal data, and information about magnetic variation in the charted area. [25]

CHART ORIENTED NOMENCLATURE. An (F zero) data base record which is independent of any charted feature and is specific to that chart only in its placement. [29]

CHART SCALE. The ratio between a distance on a chart and the corresponding distance represented, as 1:80,000 (natural scale), or 30 miles to an inch (numerical scale). May be called Map Scale when applied to any map. See also Representative Fraction. [1]

CHART SOUNDING DATUM. The tidal datum to which soundings and drying heights on a chart are referred. It is usually taken to correspond to a low water stage of the tide. Often shortened to Chart Datum, especially when it is clear that reference is not being made to a horizontal datum. [1]

CHART, TIDAL CURRENT. Set of twelve charts depicting, by means of arrows and numerals, the direction and speed of the tidal current for each hour of the tidal cycle. These charts, which may be used for any year, present a comprehensive view of the tidal current movement in twelve major harbors and waterways as a whole and provide a means for readily determining the direction and speed of the current at various places throughout the water areas covered. [25]

CHASM. A deep breach in the earth's surface; an abyss; a gorge; a deep canyon. [4]

CHIMNEY. A label on a nautical chart which indicates a relatively small, upright structure projecting above a building for the conveyance of smoke. [1]

CIRCLE, GREAT. The circle formed by the intersection of a sphere with a plane that passes through the center of the sphere. The shortest distance between any two points on a sphere is along the arc of a great circle connecting the two points. Great circles on the celestial sphere with particular designations are the Equator, the ecliptic, meridians, hours circles, prime verticals, colures, and horizons. The shortest distance on an ellipsoid of revolution is a geodetic, which is not a plane curve except for the Equator (a circle) and the meridians (ellipses). In cartography, the gnomonic map projection is the only one that transforms all great circles into straight lines. [39]

CIRCLE OF VISIBILITY. That circle surrounding an Aid to Navigation and in which the aid is visible. See Range of Visibility. [17]

CLARKE ELLIPSOID OF 1866. The reference ellipsoid adopted by the U.S. Coast and Geodetic Survey in 1880 for charting North America. This ellipsoid is not to be confused with the Clarke ellipsoid of 1880, which was the estimate of the size and shape of the earth at that time by the English geodesist. A. R. Clarke. For the Clarke ellipsoid of 1866, the semimajor axis is 6,378,206.4 meters, the semiminor axis is 6,356,583,8 meters, and the flattening or ellipticity if 1/294.98. Also called Clarke Spheroid of 1866. [1]

CLEARANCE, BRIDGE. Minimum vertical or horizontal space available for passage. [17]

CLIFF. Land arising abruptly for a considerable distance above water or surrounding land. See also Bluff. [1]

A high and extremely steep rock face, approaching the vertical, either inland or along a coastline. [35]

CLOSED. A manned aid temporarily discontinued for the winter season. [37]

CLOSING LINE. The dividing line between inland waters and the marginal sea across the entrance of a true bay. See Inland Waters, Marginal Sea. [3]

COAST. A strip of land of indefinite width (may be several miles) that extends from the shoreline inland to the first major change in terrain features. [14]

The part of the land next to the sea. This term includes natural appendages of the territory which rise out of the water, although they may not be of sufficient firmness to be inhabited or fortified. Shoals perpetually covered with water are not included under the term "coast." "Coast" is the term used with reference to the land, while "shore" is the term used with reference to the sea. [36]

COASTAL BOUNDARY. Boundary within the coastal zone, excluding one established by treaty or by the U.S. Congress. A general term for a boundary defined as the line (or measured from the line or points thereon) used to depict the intersection of the ocean surface and the land at an elevation of a particular datum. [25]

COAST CHARTS. These U.S. National Ocean Service charts are published at scales from 1:50,001 to 1:150,000, and are intended for nearshore navigation inside outlying reefs and shoals, in entering or leaving bays and harbors of considerable size, and in navigating the larger inland waterways. [29]

COASTAL CONFLUENCE ZONE. A coastal area of the United States which has an outer boundary of 50 nautical miles from shore or the 100 fathom curve, whichever is farther, and an inner boundary of the shore line or the outer boundary of the harbor entrance, whichever is farther. [29]

COASTAL PLAIN. Any plain which has its margin on the shore of a large body of water, particularly the sea, and generally represents a strip of geologically recent emerged sea bottom. [25]

COASTAL WATERS. "Coastal waters" means: (1) The U.S. waters of the Great Lakes (Lake Erie, Huron, Michigan, Ontario, and Superior): (2) The territorial seas of the United States; and (3) Those waters directly connected to the Great Lakes and territorial seas (i.e., bays, sounds, harbors, rivers, inlets, etc.) where any entrance exceeds 2 nautical miles between opposite shorelines to the first point where the largest distance between shorelines narrows to 2 miles as shown on the current edition of the appropriate National Ocean Service chart used for navigation. Shorelines of islands or points of land present within a waterway are considered when determining the distance between opposite shorelines. [2]

COAST AND GEODETIC SURVEY. A former name of the National Ocean Survey. The organization was known as: The Survey of the Coast from its founding in 1807 to 1836, Coast Survey from 1836 to 1878, and Coast and Geodetic Survey from 1878 to 1970. In 1970 it was named National Ocean Survey. From 1965 to 1970, the Coast and Geodetic Survey was a component of the Environmental Science Services Administration (ESSA). The National Ocean Service (renamed in 1982) is a component of the National Oceanic and Atmospheric Administration (NOAA). [1]

COASTING. Proceeding approximately parallel to a coastline (headland to headland) in sight of land, or sufficiently often in sight of land to fix the ship's position by observations of land features. [1]

COASTLINE. Generally, where the shore directly contacts the open sea, the line on the shore reached by the ordinary low tides comprised the coast line from which the distance of three geographic miles is measured. The line has significance for both domestic and international law (in which it is termed the "baseline"), and is subject to precise definitions. Special problems arise when offshore rocks, islands, or other bodies exist, and the line may have to be drawn to seaward of such bodies. [2]

(According to Public Law 31). Defined as the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters. [3]

COAST PILOT. A descriptive book for the use of mariners, containing detailed information of coastal waters, harbor facilities, etc. of an area. Such books are prepared by the U.S. National Ocean Service for waters of the U.S.A. and its possessions. See also Sailing Directions. [17]

COASTWISE NAVIGATION. Navigation in the vicinity of a coast, in contrast with off-shore navigation at a distance from a coast. See also Coasting. [1]

CODE. (1) (ISO) A set of unambiguous rules specifying the manner in which data may be represented in a discrete form. Synonymous with coding scheme. (2) A set of items, such as abbreviations, representing the members of another set. (3) (ISO) To represent data or a computer program in a symbolic form that can be accepted by a processor. (4) To write a routine. (5) (ISO) Deprecated term for coded representation, code set. (6) (ISO) Synonym for coded representation. [20]

(1) A system of symbols for representing data or instructions in a computer or a tabulating machine. (2) To translate the program for the solution of a problem on a given computer into a sequence of machine language or pseudoinstructions and address acceptable to that computer. (Related to encode.) [34]

CODING DELAY. An arbitrary time delay in the transmission of pulse signals. In the LORAN system this is inserted between the transmission of master and slave signals to prevent zero or small readings, and aid in distinguishing between master and slave station signals. [17]

COLOR COMPOSITE. A composite in which the component images are shown in different colors. [28]

COLOR PLATE. The press plate from which any given color is printed. Also, by extension, a drawing or negative prepared for a particular color. [28]

COLOR PROOF. Proof of combined and registered plates printed in proper colors. [33]

COLOR SEPARATION. The process of preparing a separate drawing, engraving, or negative for each color required in the production of a lithographed map or chart. [10]

In scribing, the procedure of making a separate engraving for each color required for multicolor reproduction. This may be termed "physical isolation" of the colors, as

distinguished from photographic isolation (commonly used in the graphic arts) by means of colored filters and photosensitive materials. [28]

COLREGS. Acronym for International Regulations for Preventing Collisions at Sea. Lines of demarcation delineating those waters upon which mariners must comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners must comply with the Navigation Rules for Harbors, Rivers, and Inland Waters (Inland Rules). The waters outside the lines are COLREGS waters. For specifics concerning COLREGS Demarcation Lines see U.S. Code of Federal Regulations, Title 33, Navigation and Navigable Waters; Part 82, COLREGS Demarcation Lines. [1]

COMMISSIONED. An aid previously reported closed or withdrawn which has been placed in operation. [37]

COMPASS COURSE. (1) Course relative to compass north. (2) Compass Direction. Horizontal direction expressed as angular distance from compass north. (3) Compass Error. The angle by which a compass direction differs from the true direction; the algebraic sum of variation and deviation; the angle between the true meridian and the axis of the compass card, expressed in degrees east or west to indicate the direction of compass north with respect to true north. [1]

COMPASS DIRECTION. Direction as indicated by compass without any allowances for compass error. The direction indicated by a compass may differ by a considerable amount from true or magnetic direction. [7]

COMPASS, GYROSCOPIC. (1) A compass consisting of a gyroscope suspended so that its axis of rotation points north. Gravitational torque and the Earth's rotation combine to cause the gyroscope's axis of rotation to process along an ellipse if motion is unconstrained. A damping force is therefore imposed on the processing motion, which causes the axis to move in a spiral path ending at north. At high latitudes, gyroscopic compasses become undependable. A magnetic compass fixed to a mounting stabilized by gyroscopes is sometimes mistakenly referred to as a gyroscopic compass. [39]

COMPASS, MAGNETIC. A device that indicates direction by means of a magnet supported at its midpoint so that the magnet aligns itself with the local magnetic field. The end of the magnet which points in the general direction of North is marked. [39]

COMPASS NORTH. The uncorrected direction indicated by the north-seeking end of a compass needle. See also Magnetic North. [13]

COMPASS POINTS. The 32 divisions of a compass, at intervals of 11¼°. Each division is further divided into quarter points. The stating in order of the names of the points (and sometimes the half and quarter points) is called Boxing the Compass. [1]

COMPASS ROSE. A circle graduated in degrees, clockwise from 0° at the reference direction to 360°, and sometimes also in compass points. Compass roses are placed at convenient locations on the Mercator chart or plotting sheet to facilitate measurement of direction. See also Protractor. [1]

A circle graduated in degrees clockwise from 0° (north) to 360° printed on a chart for use as a Protractor. Compass roses are also placed at other convenient locations to facilitate measurements of directions. They may be oriented to the True or the Magnetic North. [17]

COMPILATION. (1) The production of a new or revised map or chart, or portions thereof, from existing maps, aerial photographs, surveys, new data and other sources. (2) The production of a map or chart, or portions thereof, from aerial photographs and geodetic control data, by means of photogrammetric instruments. The process is called "stereocompilation" if stereoscopic plotting instruments are used [39]

Selection, assembly, and graphic presentation of all relevant information required for the preparation of a map or chart. Such information may be derived from other maps or charts or from other sources. (2) (Photogrammetry) The production of a new or recompiled map, chart, or related product from aerial photographs and geodetic control data by use of photogrammetric instruments. Also called photogrammetric compilation; stereocompilation. [10]

COMPILATION DRAWING. A Compilation Drawing is a plastic medium which serves as the base map of the new or reconstructed chart. The black Compilation Drawing serves as the base upon which additional color drawings are registered to and constructed, or additional colors (except magenta) may be added. [29]

COMPILATION HISTORY. Complete information regarding the development of a map or chart. It explains problems encountered and their solution, and aids in simplifying the research and analysis of source materials considered for compilation or revision of other maps or charts. The compilation history contains information on the planning factors, source materials utilized, control, compilation methods, drafting, reproduction, and edit procedures. [10]

COMPILATION MANUSCRIPT. The original drawing, or group of drawings, of a map or chart as compiled or constructed from various data on which cartographic and related detail is delineated in colors on a stable-base medium. A compilation manuscript may consist of a single drawing called a base manuscript, or because of congestion, several overlays may be prepared showing vegetation, relief, names, and other information. Since the latter is usually the case, the base and its appropriate overlays are collectively termed the compilation manuscript. [10]

COMPILATION SCALE. The scale at which a map or chart is delineated on the original manuscript. This scale may vary from that of the reproduction scale. [10]

COMPOSITE. Reproduction from a successive series of images. A proof made by exposing color-separation negatives one after the other on a single sheet of paper. Used in checking and editing. Also called composite print. See also color composite; color proof. [10]

A print consisting of two or more images surprinted in register to form one image. [28]

COMPUTER-ASSISTED (COMPUTER-AIDED) CARTOGRAPHIC SYSTEM. A system which is used to perform specific cartographic function by means of computer hardware and

software which aids the humans in the system to make and/or perform their decisions. Because of the graphic nature of cartography, such a system always contains, or makes use of, a computer graphics system. [22]

COMPUTER GRAPHICS. Communication with a computer by means of graphical symbols such as lines, curves, dots, etc., and so forth. Traditionally computers are understood to be activated by data on punch cards, paper tapes or magnetic tapes. Computer graphics refers to sketching and drawing facility being available for both input to and output from the computer. [22]

COMPUTER GRAPHICS SYSTEM. A system consisting of a computer with usual alpha-numeric peripherals and at least one on-line graphic display or plotter and the necessary software to create graphic images out of digital data. [22]

COMPUTER MAPPING. The production of thematic and other maps through utilization primarily of the analytic power and the speed of the computer. [22]

COMPUTER PROGRAM. (1) (ISO) A sequence of instructions suitable for processing by a computer. Processing may include the use of an assembler, a compiler, an interpreter, or a translator to prepare the program for execution, as well as to execute it. [20]

A plan or routine or set of instructions for solving a problem on a computer, as contrasted with such terms as fiscal program, military program, and development programs. [34]

COMPUTER SYSTEM (ISO). A functional unit, consisting of one or more computers and associated software, that uses common storage for all or part of a program and also for all or part of the data necessary for the execution of the program; executes user-written or user-designated programs; performs user-designated data manipulation, including arithmetic operations and logic operations; and that can execute programs that modify themselves during their execution. A computer system may be a stand-alone unit or may consist of several interconnected units. Synonymous with ADP system, computing system. [20]

CONSOL. A long range, azimuthal radionavigation system of low accuracy operated primarily for air navigation. Although not sufficiently accurate for coastal navigation or making landfall, the system can be useful to the marine navigator as an aid to ocean navigation. The system is described as azimuthal even though it is basically a hyperbolic system. (A hyperbolic system can be considered directional (azimuthal) beyond a distance of a few miles from the station if the baseline is very short.) Sometimes Consol is classified as a radiobeacon because of the frequency of operation and being azimuthal. A modified form of Consol called Conslan was developed in the United States. In this system only two antennas are used. In the U.S.S.R. a further modification of Consol is in use. This system, called BPM5, uses five antennas in the form of a cross to obtain narrower dot and dash sectors. The main advantage of Consol is that the signal can be received on a standard communications receiver. [1]

CONTACT. Said of photographic exposure made by placing the medium, such as film or paper, receiving the image in contact with the medium from which the image is to be transferred. No camera or lens system is used in contact exposure. [29]

CONTACT SCREEN. A halftone screen made on film base and having a graded dot pattern. It is used in direct contact with the film or plate to obtain a halftone pattern from a continuous-tone original. [29]

CONTAINERIZED CARGO. Cargo which is carried in sealed, specially constructed containers. In "roll-on/roll-off" container operations, truck trailers, complete with chassis and wheels, are rolled on to and off of special types of ships or barges by means of ramps. In "lift-on/lift-off" operations, containers are loaded and unloaded by means of high-speed shipboard or shore-based cranes. The containers are usually constructed of aluminum, and, in the U.S., are usually 8x8x20 feet or 8x8x40 feet. Container-ships are generally specially built or converted for the purpose. Containers are carried by both truck and rail to and from marine terminals, and a continuing effort is being made to standardize the configuration of the containers so that they are suitable for efficient interchanging among the three types of carriers. [15]

CONTERMINOUS UNITED STATES. Comprises the 48 States of the United States and the District of Columbia; all of the states exclusive of Alaska and Hawaii. They have common boundaries and are not separated by foreign territory or the high seas. [3]

CONTIGUOUS ZONE. "Contiguous Zone" means the belt of high seas, 9 nautical miles wide, that is adjacent to and seaward of the territorial seas of the United States and that was declared to exist in Department of State Public Notice 358 of June 1, 1972, 37 FR 11906. [2]

In international law, an area of the high seas outside and adjacent to the territorial sea of a country but not beyond 12 miles from the baseline from which the breadth of the territorial sea is measured. See High Seas. [3]

CONTINUOUS TONE. An image which has not been screened and contains unbroken, gradient tones from black to white, and may be either in negative or positive form. Aerial photographs are examples of continuous-tone prints. See also Halftone. [10]

Tone variation in a negative or print, due to variations in blackness, or density, such as those seen in the ordinary snapshot. [28]

CONTINENTAL BORDERLAND. A province adjacent to a continent, normally occupied by or bordering a Continental Shelf, that is highly irregular with depths well in excess of those typical of a continental shelf. [4]

CONTINENTAL MARGIN. The zone, generally consisting of shelf, slope and rise, separating the continent from the abyssal plain or deep sea bottom. [18]

CONTINENTAL RISE. A gentle slope rising from the oceanic depths towards the foot of a continental slope. [18]

CONTINENTAL SHELF. The submerged portion of a continent which slopes gently seaward from the low-water line to a point where a substantial break in grade occurs, at which point the bottom slopes seaward at a considerable increase in slope until the great ocean depths are

reached. The point of break defines the "edge" of the shelf, and the steeper sloping bottom the "continental slope." Conventionally, the edge is taken at 100 fathoms (or 200 meters) but instances are known where the increase in slope occurs at more than 200 or less than 65 fathoms. [3]

CONTINENTAL SLOPE. The declivity from the outer edge of the continental shelf into great depths. See Continental Shelf, Continental Terrace. [3]

CONTINENTAL TERRACE. The zone around the continents, extending from low-water line to the base of the continental slope. See Continental Shelf, Continental Slope. [3]

CONTOUR. A line joining points of equal vertical distance above or below a datum. Such a line on a map is a type of Isoline. [21]

A line connecting points of equal elevation or equal depth. See also Form Line, Hachures, Index Contour Line. [17]

CONTOUR LINE. A line connecting points of equal elevation or equal depth. One connecting points of equal depth is usually called a depth contour, but if depth is expressed in fathoms, it may be called a fathom curve or fathom line. See Form Line. [1]

CONTROL. (1) The coordinated and correlated dimensional data used in geodesy and cartography to determine the positions and elevations of points on the earth's surface or on a cartographic representation of that surface. (2) A collective term for a system of marks or objects on the earth or on a map or a photograph, whose positions or elevations, or both, have been or will be determined. [1]

A system of points with established positions or elevations, or both, which are used as fixed references in positioning and correlating map features. Control is generally classified in four orders (with first order denoting highest quality) according to the precision of the methods and instruments used on establishing it, and the accuracy of the resultant positions and elevations. Often call basic control. [17]

CONTROL, BASIC. In general, the data associated with a set of control stations and used as the basis for detailed surveys. Basic control is not changed by the detailed surveys nor by their subsequent adjustment. Basic control may be horizontal, vertical, or both. The basic control for topographic maps of the United States consists of the data from first- and second-order triangulation and traverse and from first- and second-order leveling. [39]

CONTROL CHARACTER. A character whose occurrence in a particular context initiates, modifies, or stops a control operation, e.g., a character that controls carriage return, a character that controls transmission of data over communication networks. A control character may be recorded for use in a subsequent action. It may in some circumstances have a graphic representation. [9]

CONTROL, GEODETIC. (1) A synonym for control. (2) A set of control stations established by geodetic methods. The data of geodetic control consist first of the distances, directions, and angles, between control stations. These are converted to geodetic coordinates and

azimuths. The latter, in turn, may be converted into other kinds of coordinates such as plane coordinates in a State plane coordinate system. This is the form in which they are usually used in the United States for local surveys. [39]

CONTROL, GROUND. A point or set of points, the coordinates of which have been determined by survey, used for fixing the scale and position of a photogrammetrically determined network. Also called photogrammetric control or field control. [39]

CONTROLLING DEPTH. (1) The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter. (2) The least depth within the limits of a channel; it restricts the safe use of the channel to drafts of less than that depth. The centerline controlling depth of a channel applies only to the channel centerline; lesser depths may exist in the remainder of the channel. The mid-channel controlling depth of a channel is the controlling depth of only the middle half of the channel. See also Federal Project Depth. [1]

CONTROL, NATIONAL, SURVEY NETS. Two control survey nets being extended over the United States by the National Geodetic Survey for the control of nautical charts and topographic maps, and comprising: (1) The horizontal-control survey net consisting of arcs of first- and second-order triangulation, and lines of first- and second-order traverse, a few of which have been run by the U.S. Geological Survey, the Corps of Engineers, and other organizations. The derived data in this survey are being coordinated and correlated on the North American Datum of 1927. (2) The vertical-control survey net consisting of lines of first- and second-order spirit leveling which determine the elevations of thousands of bench marks above a common datum, mean sea level. This net also includes lines run by the U.S. Geological Survey, the Corps of Engineers, and other organizations. [25]

CONTROL POINT. A reference point precisely located on a photograph and on the ground; used in assembling photographs for map compilation. [23]

CONTROL, VERTICAL. (1) Control points whose elevations are accurately known can be identified with physical points on the Earth, and can be used to provide elevations for other surveys. Elevations are referred, by definition, to the geoid. However, horizontal surfaces through selected points on mean sea level have been used for reference, as have non-horizontal surfaces defined by a combination of leveling surveys and points on mean sea level. (2) The elevations (or approximations thereto) associated with control points. [39]

CONVENTIONAL NAUTICAL CHARTS. These charts are flat, printed reproductions published by the U.S. National Ocean Service of some portion of the navigational part of the Earth's surface. Depending on their scale, these charts show the nature and shape of the coast, depth of the water, general configuration and character of the bottom, prominent landmarks, port facilities, cultural details, dredged channels, aids to navigation, marine hazards, magnetic variations, and seaward boundaries. Changes brought about by people and nature require that nautical charts be constantly maintained to aid safe navigation. The NOS area of nautical charting responsibility includes the national and territorial coastal waters of the United States including the Great Lakes, Puerto Rico, U.S. Virgin Islands, U.S. Trust Territories, and other islands in the Atlantic and Pacific Oceans. See International Nautical Charts, Sailing Charts, General Charts, Coast Charts, and Harbor Charts. [29]

COORDINATED UNIVERSAL TIME (UTC). The time scale that is available from most broadcast time signals. It differs from International Atomic Time (TAI) by an integral number of seconds. UTC is maintained within 1 second of UTl by the introduction of 1-second steps (leap seconds) when necessary, normally at the end of December. DUTl, an approximation to the difference UTl minus UTC, is transmitted in code on broadcast time signals. [1]

COORDINATES. Linear or angular quantities which designate the position of a point in relation to a given reference system. [17]

One of a set of magnitudes defining a point in space. If the point is known to be on a given line, only one coordinate is needed; if on a surface, two are required; if in space, three. Cartesian coordinates define a point relative to two intersecting lines, called Axes. If the axes are perpendicular, the coordinates are rectangular; if not perpendicular, they are oblique coordinates. A three-dimensional system of Cartesian coordinates is called space coordinates. Polar coordinates define a point by its distance and direction from a fixed point called the Pole. Direction is given as the angle between a reference radius vector and a radius vector to the point. If three dimensions are involved, two angles are used to locate the radius vector. Spherical coordinates define a point on a sphere or spheroid by its angular distances from a primary great circle and from a reference secondary great circle. Geographical or terrestrial coordinates define a point on the surface of the earth. [1]

COORDINATES, GEODETIC. Quantities which define the horizontal position of a point on the spheroid of reference with respect to the planes of geodetic equator and of a selected geodetic meridian. [17]

One of a set of coordinates designating the location of a point with respect to the reference ellipsoid and with respect to the planes of the geodetic Equator and a selected geodetic meridian. [39]

COORDINATE, GEOGRAPHIC. (1) An inclusive term, used to designate either a geodetic or an astronomic coordinate. (2) The term may also designate one of a pair of coordinates that specify the angular distances of a point from a meridian and from the Equator. [39]

COORDINATES, GRID. A plane rectangular coordinate system based on, and mathematically adjusted to, a Map Projection, so that Geographic Positions in terms of Latitude and Longitude can be readily transformed into Plane coordinates, and the computation relating to them made by the ordinary methods of plane surveying. [17]

COORDINATES, ORIGIN OF. The point of intersection of the coordinate axes, from which the coordinates are reckoned. In mathematical treaties, this origin is usually given the coordinates 0, 0; in surveying, however, it is standard practice to give this origin, coordinates having large positive numerical values, thereby avoiding the use of negative coordinates. Also called point of origin. [17]

COORDINATES, PLANE RECTANGULAR. A system of coordinates in a horizontal plane used to describe the positions of points with respect to an arbitrary origin by means of two distances perpendicular to each other. The two reference lines at right angles to each other passing through the origin are called the coordinate axes. The distances parallel to the true

(or arbitrarily assigned) north-south axis are called the ordinates, or the y coordinates. The distances parallel to the true (or arbitrarily assigned) east-west axis are called the abscissae, or the x coordinates. The north and east directions are usually taken as positive, and the south and west direction are usually taken as negative. Also referred to as plane coordinates. [17]

COORDINATE, STATE PLANE. One of a pair of coordinates in one of the plane rectangular coordinate systems known as the State Plane coordinate systems.
Each State in the United States of America has its own State plane coordinate system (or State coordinate system). When necessary, the coordinates in the coordinate system of a particular State are referred to by the name of the State, e.g., Georgia plane coordinates. State plane coordinates are used extensively for calculating and recording the results of land surveys. [39]

COORDINATE SYSTEM, GRID. A coordinate system on a plane usually based on a map projection. The most common form is a rectangular Cartesian coordinate system. An example is the State plane coordinate system. Polar coordinate systems are also used, for example, in aviation and artillery firing. The advantage of a grid coordinate system is that plane coordinates may be substituted for geographic coordinates and the computations relating to them may be made by the simple methods of plane surveying. [39]

COORDINATE SYSTEM, RECTANGULAR CARTESIAN. A coordinate system consisting of straight line axes intersecting at a common point and perpendicular to each other; the coordinates of a point are the distances from the point along a line parallel to one axis and extending to the plane containing the other axes. This is equivalent to specifying a coordinate system that is both rectangular and Cartesian. [39]

COORDINATE SYSTEM, STATE PLANE. One of the plane rectangular coordinate systems, one for each State in the Union, established by the U.S. Coast and Geodetic Survey in 1933 for use in defining locations of geodetic stations in terms of plane-rectangular Cartesian coordinates. Also called State coordinate system. Each State is mapped by a conformal map projection in one or more zones, over each of which is placed a rectangular grid. Zones of limited east-west extent and indefinite north-south extent are mapped by a transverse Mercator map projection; zones of indefinite east-west extent and limited north-south extent are mapped by the Lambert conformal conic map projection with two standard parallels. Zone one of Alaska is on the oblique Mercator map projection. The use of the projections assures that, for zones having a width of 250 km, the greatest departure from exact scale (scale error) is 1 part in 10,000. All geodetic positions determined by the National Geodetic Survey or its predecessor are transformed into plane-rectangular coordinates on the proper grid, and are distributed by the Survey together with the geodetic positions. When the new North American Datum of 1983 replaces the North American Datum of 1927, the State plane coordinate system (SPCS) will be modified in the following respects. (a) Distances and coordinates are expressed in meters. (b) The transformations from geodetic to grid coordinates are revised to yield errors less than 0.01 m for a point within the boundaries of a zone. [39]

COPY. A term liberally used to mean anything submitted for graphic reproduction; as an original which can be more specifically defined as either "line copy" or "tone copy." In the strictest sense, only manuscript or text submitted to the printer is considered copy. [30]

COPY DOT. Photography for photomechanical reproduction of halftone illustrations and associated line copy with no re-screening of the illustrations. The halftone dots of the original are copies as "line" material. [28]

CORAL. In the strict sense, is a bottom dwelling marine organism which secretes an external skeleton of calcium carbonate and which frequently forms large, irregular colonies with numerous coral heads and pinnacle. In reality, coral formations are usually a mixture of coral and other marine organisms along with other debris and chemically precipitated rock. For shoreline mapping purposes, a rock or coral formation is a naturally occurring, consolidated rock or coral mass that differs conspicuously from adjacent objects and materials and which is too large to be adequately represented on the shoreline map by a single rock (coral) symbol. These formations include masses of irregular shape as well as those relatively flat, ledge type features that may fringe a shore. [31]

CORAL HEAD. A massive mushroom or pillar shaped coral growth. [1]

CORAL REEF. A reef made up of coral, fragment of coral and other organisms, and the limestone resulting from their consolidation. [4]

CORRECTION OVERPRINT. The addition of a new and/or the eradication of an existing entry on a map by means of an Overprint. [21]

CORRECTION OF SOUNDINGS. The adjustment of soundings for any departure from true depth because of the method of sounding or any fault in the measuring apparatus. See also Reduction of Soundings. [1]

COULEE. A steep-walled, trench-like valley; a wash, gulch, or arroyo through which water flows intermittently. (Western U.S.) [4]

COURSE. The intended horizontal direction of travel. It is mea- sured from 0° at the reference direction clockwise through 360°; strictly for marine navigation, the term applies to the direction to be steered, which sometimes differs from the direction intended to be made good over the ground. The course is designated as true, magnetic, compass, or grid as the reference direction is true, magnetic, compass or grid north respectively. [17]

(Navigation) The azimuth of bearing of a line along which a ship or aircraft is to travel or does travel, without change of direction; the line drawn on a chart or map as the intended track. The direction of a course is always measured in degrees from the true meridian, and the true course is always meant unless it is otherwise qualified; e.g., as a magnetic or compass course. See also rack. [10]

COURSE, RECOMMENDED. A line shown on a chart, which has been specially examined to ensure that it is free of dangers, and along which ships are advised to navigate. Also called recommended track. [17]

COVE. A small, sheltered recess in a coast, often inside a larger embayment. [14]

COVERS AND UNCOVERS (OR DISCOVERS). Expression intended to indicate an area of a reef or other projection from the bottom of a body of water which periodically extends above and is submerged below the surface. Also referred to as dries or uncovers. See also Awash [17]

CPU. Acronym for "Central Processing Unit." [22]

CRAG. A steep, rugged rock; a rough, broken cliff of a projecting point of rock; also a detached fragment of rock. [4]

CRATER. The bowl-shaped depression around the vent or a volcano or a geyser; also hole formed by the impact of a meteorite, the detonation of a mine, or the like. [4]

CREEK. (1) A stream of less volume than a river but larger than a brook. (2) A small tidal channel through a coastal marsh. (3) A wide arm of a river or bay, as used locally in Maryland and Virginia. [1]

CREST. The summit land of any eminence; the highest natural projection which crowns a hill or mountain, from which the surface dips downward in opposite directions. [4]

CREVASSE. A deep crevice, or fissure, especially in a glacier. A break in a levee or other stream embankment. [4]

CRIB. A permanent marine structure usually designed to support or elevate pipelines; especially a structure enclosing a screening device at the offshore end of a potable water intake pipe. The structure is commonly a heavy timber enclosure that has been sunken with rocks or other debris. [29]

CROSS LINES OF SOUNDING. Sounding lines run approximately at right angles to those of normal direction, frequently useful when examining shoals. Cross lines are also run after completing the main system of sounding lines, with the purpose of checking them. [17]

CRT. Acronym for "Cathode Ray Tube." [22]

CULTURE. Features that are under, on, and above the ground which are delineated on the map and were constructed by man. These features include roads, trails, buildings, canals, sewer systems, and boundary lines. In a broad sense, the term also applies to all names, other identification, and legends on a map. [25]

Features under, on, and above the ground which are delineated on the map or chart and were constructed by man. These features include cities, highways, submarine cables, and aids to navigation. Boundary lines, latitude and longitude lines, isogonic lines, etc. are properly classified as culture. [1]

CUPOLA. A label on a nautical chart which indicates a small dome-shaped tower or turret rising from a building. [1]

CURRENT. Generally, a horizontal movement of water. Currents may be classified as tidal and nontidal. Tidal currents are caused by gravitational interactions between the Sun, Moon, and

Earth and are part of the same general movement of the sea that is manifested in the vertical rise and fall, called tide. Tidal currents are periodic with a net velocity of zero over the particular tidal cycle. See Tidal Wave.

Nontidal currents include the permanent currents in the general circulatory systems of the sea as well as temporary currents arising from more pronounced meteorological variability. Current, however, is also the British equivalent of our nontidal current. [7]

CURRENT DIAGRAM. A graphic table showing the speeds of the flood and ebb currents and the times of slacks and strengths over a considerable stretch of the channel of a tidal waterway, the times being referred to tide or tidal current phases at some reference station. [7]

CURRENT ROSE. A graphic presentation of currents for specified areas, utilizing arrows at the cardinal and intercardinal compass points to show the direction toward which the prevailing current flows and the percent frequency of set for a given period of time. The arrows on some presentations may be further subdivided (by thickness or pattern) to designate categories of current speeds. [10]

CURRENT STATION. The geographic location at which current observations are conducted. Also, the facilities used to make current observations. These may include a buoy, ground tackle, current meters, recording mechanism, and radio transmitter. See control current station and subordinate current station. [7]

CURRENT TABLES. Tables listing predication of the times and speeds of tidal currents at various places, an other pertinent information. See Tidal Current Tables. [17]

CURSOR (ISO). A movable, visible mark used to indicate the position on which the next operation will occur on a display surface. [20]

A position indicator employed in a display on a video terminal to indicate a character to be corrected or a position in which data is to be entered. On some terminals, the cursor can be moved around freely, but usually the movements are more restricted. Typical cursors include a line under the character at hand, a nondestructive blinking white block, and a white block on which an existing character on the screen is reversed. Typical cursor keyboard commands are up, down, left, and right keys, there is usually a repeating feature for rapid long-distance cursor movement. When cursor control keys are not enough, other interactive control devices are sometimes available as options. These include a joystick, a light pen, a trackball, and a set of thumbwheel controls. These techniques are most useful on graphic terminals. [34]

(1) A display element which indicates position and can be moved around by a positioning device, stylus or puck and appropriate software. Same as tracking symbol. (2) A handheld device with a cross hair or other reference mark for indicating position on a digitizer or digital tablet. Also called puck, if shaped and freely movable like an ice hockey puck. [22]

CUT-OFF. (1) A new and relatively short channel formed when a stream cuts through the neck of an oxbow or horseshoe bend. An artificial straightening or short-cut in a channel. [1]

A straight channel dredged through a bend in a winding waterway (usually a river), thus straightening and shortening the route for navigating the waterway; navigation of the bend so cut off from the former course of the waterway may or may not be possible after construction of the cut-off. [15]

CYBERNETICS. That branch of learning which brings together theories and studies on communication and control in living organisms and machines. [9]

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D

DALLES. The nearly vertical walls of a canyon or gorge, usually containing a rapid. Local in Northwest. [4]

DANGER AREA. A specified area above, below, or within which there may exist potential danger. See also Restricted Area. [1]

DANGER LINE. (1) A line drawn on a chart to indicate the limits of safe navigation for a vessel of specific draft. (2) A line of small dots used to draw the navigator's attention to a danger which would not stand out clearly enough if it were represented on the chart solely by the specific symbols. This line of small dots is also used to delimit areas containing numerous dangers, through which it is unsafe to navigate. [1]

DANGEROUS CARGO. The term "dangerous cargo" means all explosives and other hazardous materials or cargo covered by - (a) Dangerous Cargoes, 46 CFR Parts 146 and 148; (b) Tank Vessels, 46 CFR Parts 30-38; or (c) Hazardous Materials, 49 CFR Parts 170-179, except for those materials preceded by an "A" in the hazardous Materials Table, 49 CFR 172.101. [2]

DANGEROUS ROCK. A sunken rock of a small area (Pinnacle), at such a depth as to be considered dangerous to surface navigation. [17]

DANGEROUS WRECK. A wreck submerged at such a depth as to be considered dangerous to surface navigation. [17]

DANGER SOUNDING. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation. [1]

DATA. (1) (ISO) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means. (2) Any representations such as characters or analog quantities to which meaning is or might be assigned. (3) See Digital Data [20]

(1) A general term used to denote any or all facts, numbers, letters and symbols that refer to or describe an object, idea, condition, situation, or other factors. It connotes basic elements of information which can be processed or produced by a computer. Sometimes data are considered to be expressible only in numerical form, but information is not so limited. (Related to information.) (2) Plural of the term datum. Collectively used to designate alphabetic or numeric material serving as a basis of discussion. [34]

DATA ACQUISITION PHASE. In a computer-assisted or automatic cartographic system the process of identification, isolation and gathering of the data (alphanumeric and/or graphic) to be entered into the system and/or the actual input of these data, including digitizing. [22]

DATA BANK. An organized collection of data, usually in digital form, together with specific software to access the data or to support access by user-written programs. May be synonymous with data base.

May be just a collection of files, but in its strictest sense contrasting with files, since the data organization is normally quite different from files. [20]

Refers to the digital data base, plus new data arrivals transformed, where necessary, into digital form. The term data bank also includes the digital data storage, retrieval, and update systems used to manipulate the data. [32]

DATA BASE. (1) (ISO) A set of data, part or the whole of another set of data, and consisting of at least one file, that is sufficient for a given purpose or for a given data processing system. (2) A collection of data fundamental to a system. (3) A collection of data fundamental to an enterprise. [20]

A typical data base is a vast and continuously updated file of information, abstracts, or references on a particular subject or subjects. On-line data bases are designed so that by using subject headings, key words, key phrases, or authors, users can quickly and economically search for, sort, analyze and print out data on their terminal. [34]

A collection of data fundamental to a given data processing enterprise. Sometimes a subset of a data bank, sometimes synonymous with "data bank". In interactive applications necessarily stored on a random access device and organized by special data base management software. [22]

Refers to the mass of data presently existing, most of which must be transformed into digital format before being entered into a data bank. [32]

DATA ENTRY PHASE. The input of data into a data processing system, normally together with initial processing of the data. [22]

DATE LINE, INTERNATIONAL. A particular, hypothetical line on the Earth separating neighboring regions in which time differs by one day. It coincides basically with the 180° meridian, but with deviations to avoid separating contiguous or nearby inhabited areas. Also called simply the date line. [39]

DATUM. A reference point, line, or plane used as a basis for measurements. For a group of statistical references, the plural form is data, as geographic data for a list of latitudes and longitudes, but where the concept is geometrical, rather than statistical, the plural form is datums, as two geographic datums. See Datum Plane. [3]

Any numerical or geometrical quantity or set of such quantities which may serve as a reference or base for other quantities. In geodesy two types of datums must be considered: a horizontal datum which forms the basis for computations of horizontal control surveys in which the curvature of the earth is considered, and a vertical datum to which elevations are referred. See also Horizontal Geodetic Datum, Vertical Control Datum, Chart Sounding Datum, Vertical Datum. [1]

A datum is a point, line, or surface used as a reference in surveying and mapping. The terms "chart datum" and "sounding datum" are synonymous. They are the water surface to which soundings are referenced. This can be the lower low water surface in tidal areas, the water

surface at a given lake level in the Great Lakes, a sloping water surface along nontidal rivers, or any other surface that has been designated for a specific project. A shoreline datum is the datum that describes a shoreline along its line of intersection with a land surface. This is normally the mean high water surface in tidal areas, or any other surface that has been designated for a specific project. [31]

Any numerical or geometrical quantity or set of such quantities which may serve as a reference or base for other quantities. For a group of statistical references, the plural form is data; as, geographic data for a list of latitudes and longitudes. Where the concept is geometrical and particular, rather than statistical and inclusive, the plural form is datums, as, for example, two geodetic datums have been used in the U.S. in recent years. [12]

DATUM, GEODETIC. (1) A set of constants specifying the coordinate system used for geodetic control, i.e., for calculating coordinates of points on the Earth. At least eight constants are needed to form a complete datum: three to specify the location of the origin of the coordinate system, three to specify the orientation of the coordinate system, and two to specify the dimensions of the reference ellipsoid. Before geocentric geodetic datums became possible, it was customary to define a geodetic datum by five quantities: the latitude and longitude of an initial point, the azimuth of a line from this point, and the (two) parameters of a reference ellipsoid. In addition, specification of the components of the deflection of the vertical at the initial point, or the condition that the minor axis of the ellipsoid be parallel to the Earth's axis of rotation provided two more quantities. The datum was still not complete because the origin of the coordinate system remained free to shift in one dimension. This meaning does not conform to modern usage. The term datum is often used as a synonym for geodetic datum. (2) The datum, as defined in (1), together with the coordinate system and the set of all points and lines whose coordinates, lengths, and directions have been determined by measurement or calculation. [39]

DATUM, NATIONAL GEODETIC VERTICAL (NGVD). Fixed reference adopted as a standard geodetic datum for heights. The datum was derived for land surveys from a general adjustment of the first-order level nets of both the United States and Canada. In the adjustment 21 tide stations in the United States and 5 in Canada were held as fixed. The geodetic datum now in use in the United States is the National Geodetic Vertical Datum of 1929. The year indicates the time of the last general adjustment. The geodetic datum is fixed and does not take into account the changing stands of sea level. Because there are many variables affecting sea level, and because the geodetic datum represents a best fit over a broad area, the relationship between the geodetic datum and local mean sea level is not consistent from one location to another in either time or space. For this reason, the National Geodetic Vertical Datum should not be confused with mean sea level. [25]

DATUM PLANE. A surface used as a reference from which heights or depths are reckoned. The plane is called a tidal datum when defined by a phase of the tide, for example, high water or low water. See Tidal Datums. [3]

A vertical control datum. Although a level surface is not a plane, the vertical control datum is frequently referred to as the datum plane. [17]

DATUM SOUNDING. The horizontal plane or tidal datum to which the soundings on a hydrographic survey are reduced. Also called datum for sounding reduction. [17]

DATUM, TIDAL. A surface with a designated elevation from which heights or depths are reckoned, defined by a certain phase of the tide. A tidal datum is local, usually valid only for a restricted area about the tide gage used in defining the datum. For permanency and convenience, a bench mark is emplaced in stable ground close to the tide gage. The elevation of the bench mark with respect to the tidal datum is determined by the tide gage. When used as reference surfaces for hydrographic surveys, tidal datums have been called datum planes; however, they are not planes and so are not treated as planes but as curved level surfaces. The tidal datum in most general use in geodesy is mean sea level. In land surveying, where boundaries and riparian rights are involved, mean high water and mean low water are sometimes used as tidal datums. [39]

A datum defined by a phase of the tide. See Datum; Leveling. When used as reference surface for hydrographic surveys, tidal datums are termed datum planes; however, they are not planes and are not treated as planes, but as level surfaces, which are curved. The tidal datum in most general use in geodetic work is mean sea level. In land surveying, where boundaries and riparian rights are involved, mean high water and mean low water are sometimes tidal datums of considerable importance. See Island; Shore. [8]

DATUM, VERTICAL. For marine applications, a base elevation used as a reference from which to reckon heights or depths. It is called a tidal datum when defined by a certain stage of the tide. Tidal datums are local datums and should not be extended into areas which have differing topographic features without substantiating measurements. (In general, these local datums are valid only in the general vicinity of the tide station recording the observations from which the datums were determined.) See chart datum. The basic vertical datum for the Great Lakes and connecting waterways is a level datum, designated the International Great Lakes Datum, 1955. Topographic mapping of the conterminous United States is based on the National Geodetic Vertical Datum of 1929. Various vertical datums are used in Alaska, Hawaii, the oceanic islands, and other offshore areas not accessible for connecting to the NGVD of 1929, each based on mean sea level at a specified tide station. [25]

For marine applications, a base elevation used as a reference from which to reckon heights or depths. It is called a tidal datum when defined in terms of a certain phase of the tide. Tidal datums are local datums and should not be extended into areas which have differing hydrographic features without substantiating measurements. In order that they may be recovered when needed, such datums are referenced to fixed points known as bench marks. See Chart Datum. [7]

DATUM, VERTICAL CONTROL. Any level surface (e.g., mean sea level) taken as a surface of reference from which to reckon elevations. Also called datum level, reference level, reference plane, levelling datum, datum for heights. See also Datum Plane. [17]

DAYBEACON. An unlighted fixed structure which is equipped with a daymark for daytime identification. [37]

An unlighted beacon. A daybeacon is identified by its color and the color, shape, and

number of its daymark. The simplest form of daybeacon consists of a single pile with a daymark affixed at or near its top. See also Daymark. [1]

DAYMARK. The daytime identifier of an aid to navigation presenting one of several standard shapes (square, triangle, rectangle) and colors. [37]

(1) The identifying characteristics of an aid to navigation which serve to facilitate its recognition against a daylight viewing background. For example the distinctive color and shape of a buoy aid identification during the daytime. On those structures that do not by themselves present an adequate viewing area to be seen at the required distance, the aid is made more visible by affixing a daymark to the structure. A daymark so affixed has a distinctive color and shape depending upon the purpose of the aid. See also Daybeacon. (2) An unlighted navigation mark. [1]

DEADHEAD. A submerged or barely awash log or tree trunk freely floating at varying attitudes in contrast to the plane formed by the still (undisturbed) surface of the water. At times, one end of a deadhead may become attached to the bottom with the opposite (unattached) end floating. [40]

DEAD RECKONING. The process of determining the position of a vessel at any instant by applying to the last well-determined position (point of departure or subsequent fix) the run that has since been made. The position so obtained is called a Dead Reckoning Position. When the principal purpose of dead reckoning is to lay down on the chart a reference plot for evaluating the reasonableness of positioning by other means, the dead reckoning plot is usually constructed without allowance for disturbing elements (such as current, wind, sea conditions, roughness of vessel's bottom, etc.), the course steered being used for direction and ordered speed being used for rate of movement along the course line. However, some navigators use course steered for direction, as above, but the rate of movement along the course line is ordered speed adjusted for all disturbing elements except current. However constructed, the reference dead reckoning plot provides a graphic presentation of positions the vessel would occupy if unaffected by disturbing elements and inaccuracies in steering and speed determination. With due recognition of its limitations, this plot of predicted future positions is used in conjunction with the Track (definition 2) to determine necessary or desirable course and/or speed changes. Also the construction of the track may be considered a form of dead reckoning. When the principal purpose of the dead reckoning is to determine the vessel's position independent of other means or in the absence of other means over considerable time periods, the dead reckoning is often laid down on the chart making allowance for disturbing elements. This practice is general among merchant navigators. Course lines between successive dead reckoning positions are constructed in accordance with the navigator's best estimate of the course to be made good. The rate of movement along the course line is in accordance with his estimate of the speed to be made good. [1]

DEBUG (ISO). To detect, to trace, and to eliminate mistakes in computer programs or in other software. Synonymous with checkout. [20]

(1) To locate and correct any errors in a computer program. (2) To detect and correct malfunctions in the computer itself. (Related to diagnostic routine.) (3) To test a program on a computer to find whether it works properly. If mistakes are revealed, they must be

traced to their source and corrected. [34]

DECCA NAVIGATOR SYSTEM. A short to medium range low frequency (70-130 kHz) radionavigation system by which a hyperbolic line of position of high accuracy is obtained. The system is an arrangement of fixed, phase locked, continuous wave transmitters operating on harmonically related frequencies and special receiving and display equipment carried on a vessel or other craft. The operation of the system depends on phase comparison of the signals from the transmitters brought to a common comparison frequency with the receiver. [1]

DECK. A collection of cards, commonly a complete set of cards which have been punched for a definite service or purpose. [24]

DECIMAL NOTATION. (1) (ISO) A notation that uses ten different characters, usually the decimal digits, e.g., the character string 196912312359, construed to represent the date and time one minute before the start of the year 1970; the representation used in the Universal Decimal Classification (UDC). These examples use decimal notation but neither satisfies the definition of the decimal numeration system. [20]

DECLINATION, MAGNETIC. The angular direction, east or west from the north branch of the celestial meridian, of magnetic north as determined by the positive pole of a freely suspended magnetic needle that is not subject to any transient, artificial disturbance. In nautical and aeronautical navigation the term variation is used instead of declination, and the angle is called variation of the compass or magnetic variation. Except for usage in navigation, magnetic declination is not synonymous with magnetic variation, which refers to regular or irregular change with time of the magnetic declination, dip, or intensity. [39]

DEEP. A relatively small area of exceptional depth found in a depression. The term is generally restricted to depths greater than 3000 fathoms. [4]

DEEP-DRAUGHT ROUTE. A route which is primarily selected for use by ships which, because of their deep draught, may not be able to navigate safely outside such route. [17]

DEEPWATER PORT. Means any fixed or floating man-made structures other than a vessel, or any group of such structures, located beyond the territorial sea and off the coast of the United States and which are used or intended for use as a port or terminal for the loading or unloading and further handling of oil for transportation to any State, except as otherwise provided in section 23 of the Act. The term includes all associated components and equipment, including pipelines, pumping stations, service platforms, mooring buoys, and similar appurtenances to the extent they are located seaward of the high water mark. [2]

DEEP WATER ROUTE. A route in a designated area within definite limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles to a minimum indicated depth of water. [19]

DEFENSE MAPPING AGENCY. The mission of the Defense Mapping Agency (DMA) is to provide mapping, charting and geodetic support and services to the Secretary of Defense, the Joint Chiefs of Staff, the military departments, and other Department of Defense components

through the production and worldwide distribution of maps, charts, precise positioning data, and digital data for strategic and tactical military operations and weapons systems. The Defense Mapping Agency was established as an agency of the Department of Defense on January 1, 1972, under the provisions of National Security Act of 1947, as amended (61 Stat. 495; 50 U.S.C. 401). It operates under the direction, authority, and control of the Under Secretary of Defense for Research and Engineering. DMA also responds directly to the Chairman, Joint Chiefs of Staff, on operational matters and requirements associated with joint planning that are of primary concern to the Chiefs. The Director of the Defense Mapping Agency: Organizes, directs, and manages the Defense Mapping Agency and its field organizations: Serves as program manager and coordinator of all Department of Defense mapping, charting, and geodesy resources and activities; Provides staff advice and assistance on mapping, charting, and geodesy matters to the Secretary of Defense, the military departments, and Joint Chiefs of Staff, other Defense components, and other governmental agencies, as appropriate; Ensures responsive support to the mapping, charting, and geodesy requirements of the military departments and the unified and specified commands; and Carries out the statutory responsibilities assigned by law for providing nautical charts and marine navigation data for the use of all vessels of the United States and of navigators generally. [27]

The Defense Mapping Agency (DMA) was organized in 1972 when the several mapping activities in DOD were consolidated into one office. Its Hydrographic Center (DMA/HC) is responsible for the preparation and dissemination of nautical charts and related publications, including Pilot charts and Notices to Mariners, for areas outside territorial waters, formerly the responsibility of the Naval Oceanographic Office. Its Topographic Center (DMA/TC) assumed the responsibilities for mapping formerly assigned to the Army Map Service (AMS), and the Aerospace Center (DMA/AC) assumed the responsibilities of the former Aeronautical Chart and Information Center (ACIC) of the Department of the Air force. DMA also includes the DOD Bathymetry Library. [38]

DEGAUSSING. Neutralization of the strength of the magnetic field of a vessel, by means of suitably arranged electric coils permanently installed in the vessel. See also Deperming. [1]

DEGAUSSING RANGE. An area for determining magnetic signatures of ships and other marine craft. Such signatures are used to determine required degaussing coil current settings and other required corrective action. Sensing instruments and cables are installed on the sea bed in the range, and there are cables leading from the range to a control position ashore. The range is usually marked by distinctive buoys. [1]

DELTA. The low alluvial land, deposited in a more or less triangular form at the mouth of a river, which is often cut by several distributaries of the main stream. [4]

DEMARCATION LINE. A line through the high seas marking the allocation of territory between two countries, rather than a boundary line; for example, the line through Bering Strait and Bering Sea between Russia and Alaska. [3]

DENSITOMETER. An instrument for the measurement of optical density of a material, generally of a photographic image. [23]

DENSITY. A numerical measure of the blackening, or light-stopping ability, of a photographic image. [28]

DENSITY OF SOUNDINGS. Intervals between lines of sounding and soundings in the same line. Density of soundings mostly depends on the scale and nature of the survey. Also called frequency of soundings. [17]

DENSITY RANGE. The measured difference between the maximum and minimum densities of a particular negative or positive. [28]

DEPERMING. The process of changing the magnetic condition of a vessel by wrapping a large conductor around it a number of times in a vertical plane, athwartships, and energizing the coil thus formed. If a single coil is placed horizontally around the vessel and energized, the process is called flashing if the coil remains stationary, and wiping if it is moved up and down. See also Degaussing. [1]

DEPRESSION. A general term signifying any depressed or lower area in the ocean floor; a hollow completely surrounded by higher ground and having no natural outlet for surface drainage. [4]

DEPRESSION CONTOUR. A closed contour delimiting an area of lower elevation than the surrounding terrain. Directional ticks extend from the contour in a downhill direction. [10]

DEPTH. The vertical distance from a given water level to the bottom. The charted depth is the vertical distance from the tidal datum to the bottom. The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter is called the controlling depth. See also Chart Sounding Datum. [1]

DEPTH CONTOUR (BATHYMETRIC CONTOUR)(ISOBATH). A line on a map joining points on the bed of the sea, or other body of water, situated at an equal vertical distance beneath the surface. To be distinguished from Submerged Contour. [21]

DEPTH CONTOUR NAVIGATION. A method of position determination by utilizing the depth contours on the nautical chart. Consists in fitting a series of observed echo soundings to the depth contours by recording a number of soundings and simultaneous log distances and plotting them on a strip of transparent paper at the scale of the chart. The line of soundings is fitted to the depth contours by moving it so that is remains parallel to the true course steered. [3]

DEPTH, CONTROLLING. The least depth in the approach or channel to an area, such as a port of anchorage, governing the maximum draft of vessels that can enter. [17]

DEPTH CURVE. A depth curve is a line connecting points of equal water depth which is sometimes significantly displaced outside of soundings, symbols, and other chart detail for clarity as well as generalization. Depth curves therefore often represent an approximate location of the line of equal depth as related to the surveyed line delineated on the source. [4]

DEPTH FINDER. An instrument for the measurement of the depth of water, particularly an echo sounder. [17]

DERELICT. Any property abandoned at sea, often of sufficient size as to constitute a menace to navigation; especially an abandoned vessel. See also Wreck. [1]

DESIGNATION HOLE (ISO). A hole punched in a punch card to indicate the nature of the data on the card or the functions that a machine is to perform. Synonymous with control hole, function hole. [20]

DESTRUCTIVE READ (ISO). A reading that also erases the data in the source location. [20]

To take information from a storage device and, by doing so, destroying the information in that device. [34]

DEVIATION. (1) The angle between the magnetic meridian and the axis of a compass card, expressed in degrees east or west to indicate the direction in which the northern end of the compass card is offset from magnetic north. Deviation is caused by disturbing magnetic influences in the immediate vicinity of the compass, as within the craft. Semicircular deviation changes sign (E or W) approximately each 180° change of heading; quadrantal deviation changes sign approximately each 90° change of heading; constant deviation is the same on any heading. Deviation of a magnetic compass after adjustment or compensation is residual deviation. Called magnetic deviation when a distinction is needed to prevent possible ambiguity. (2) Direction finder deviation. (3) Given a series of observations or measurements of a given quantity, the deviation of a single observation is the algebraic difference between the single observation and the mean or average value of the series of observations. [1]

DEVIATION, MAGNETIC. The angle between the compass needle and the magnetic meridian, expressed in degrees east or west of magnetic meridian. Also called deviation. [17]

DEVIATION (OF COMPASS). The deflection of the needle of a magnetic compass due to masses of magnetic metal within a ship on which the compass is located. This deflection varies with different headings of the ship. The deviation is called easterly and marked plus if the deflection is to the right of magnetic north, and is called westerly and marked minus if it is to the left of magnetic north. A deviation table is a tabular arrangement showing the amount of deviation for different headings of the ship. Each compass requires a separate deviation table. [7]

DEVIATION TABLE. A table of the deviation of a magnetic compass on various headings, magnetic or compass. [1]

DEVICE-CONTROL CHARACTER (ISO). A control character used for the control of auxiliary devices associated with a system such as for switching such devices on or off. [20]

DIAGNOSTIC PROGRAM (ISO). A computer program that recognizes, locates, and explains either a fault in equipment or a mistake in a computer program. [20]

DIAGONAL SCALE. A graphic scale which normally consists of eleven parallel horizontal lines the top and bottom of which are subdivided into ten equal sections. These subdivisions are then joined diagonally by offsetting one subdivision. With its aid, accurate measurements can be made to .01 and estimated measurements to .001 of the length of the scale. [21]

DIAPHONE. A sound signal emitter operating on the principle of periodic release of compressed air controlled by the reciprocating motion of a piston operated by compressed air. The diaphone usually omits a powerful sound of low pitch which often concludes with a brief sound of lower pitch called the grunt. The emitted signal of a two-toned diaphone consists of two tones of different pitch, in which case the second tone is of lower pitch. [1]

DIAPHRAGM HORN. A sound signal emitter comprising a resonant horn excited at its throat by impulsive emissions of compressed air regulated by an elastic diaphragm. Duplex or triplex horn units of different pitch produce a chime signal. Also called compressed air horn. [1]

DIAZO. A reproduction process with lines in the image usually developed by gaseous ammonia; prints are made only from a transparent or translucent original; also called blueline, blackline or ozalid. [23]

DIAZO PAPER. Paper coated with a dye, latent or visible, which is sensitive to ultra-violet light. A visible image may be obtained from this by Development with gas, liquid or heat. [21]

DICHOTOMIZING SEARCH (ISO). A search in which an ordered set of items is partitioned into two parts, one of which is rejected, the process being repeated on the accepted part until the search is completed. [20]

A search in which the series of items is divided into two parts, one of which is rejected, and the process repeated on the unrejected part until the item with the desired property is found. This process usually depends upon the presence of a known sequence in the series. [34]

DIGITAL. Pertaining to the utilization of discrete integral numbers in a given base to represent all the quantities that occur in a problem or a calculation. It is possible to express in digital form all information stored, transferred, or processed by a dual state condition; e.g., on-off, open-closed, and true-false. [24]

DIGITAL COMPUTER. A computer that operates on the principle of counting as opposed to measuring. [23]

DIGITAL DATA (ISO). Data represented by digits, perhaps with special characters and the space character. [20]

Information which is expressed in discrete or noncontinuous form. Opposite of analog data. [34]

Data which is in the format of ones and zeros. [23]

DIGITAL IMAGE (REMOTE SENSING). Image having numeric values representing gray tones; each numeric represents a different gray tone. [23]

A term sometimes loosely used for "digital image data," i.e., digital data which form part of a digital model of an image. The image itself is - by definition - always continuous reality, which in turn may be an analog model of some other part of reality. [22]

DIGITAL MANUSCRIPT TAPE. Magnetic tape containing input format data for use in a computer graphics system. [22]

DIGITAL PLOTTER. A plotter which uses a positioning mechanism performing a fixed amount of movement for each digital input signal. Contrast with "analog plotter," but often also used for the latter, because both types may use digital input data, which are processed into the control signals for positioning. [22]

DIGITAL REPRESENTATION (ISO). A discrete representation of a quantized value of a variable, i.e., the representation of a number by digits, perhaps with special characters and the space character. [20]

A representation of variables as data, by means of digits or discrete quantities, as determined by their appearance or nonappearance. [34]

DIGITIZE (ISO). To express or represent in a digital form data that are not discrete data, e.g., to obtain a digital representation of the magnitude of a physical quantity from an analog representation of that magnitude. [20]

(1) To convert from an analog representation of data to a digital one, e.g., to represent a position on a surface by a pair of coordinates with finite resolution. (2) The process of converting graphics into digital data (usually with a digitizer). This includes decisions about which geometrical information should be digitized and stored and which additional alphanumeric information must be input to describe the digitized features, and the actual input of this information. This process may be manual, semi-automatic, or automatic. [22]

To convert an analog measurement of a physical variable into a numerical value, thereby expressing the quantity in digital form. Synonymous with (quantize). [24]

DIGITIZER. A device which converts an analog measurement into digital form. Synonymous with (quantizer). [24]

DIGITIZER ACCURACY. The maximum error in either axis between a point's true coordinates and recorded coordinates. [22]

DIGITIZER FILE. The raw source file of digitized data used to define cartographic features. This would usually include both coordinates and descriptions. [22]

DIGITIZER (GENERAL PURPOSE). Any analog-to-digital (abbreviated: A/D) converter. [22]

DIGITIZER (GRAPHIC). A device for the conversion of graphics into digital data. It consists of a flat or cylindrical surface to hold the graphics and electronics to sense either certain elements of the graphic at predefined positions (see "scanner") or the position of a cursor or stylus. Output are signals representing pairs of coordinates and in some cases also signals to indicate the quality of traces features. These signals may be recorded by a data recorder (e.g., a magnetic tape recorder), a procedure called "off-line digitizing," or processed directly by a computer in case of on-line digitizing. [22]

DIGITIZING MODE. The mode of capture of coordinates in digitizing. Contrasting modes are point mode and dynamic mode. Within dynamic mode, distance mode or time mode may be used, or even both together. [22]

DIFFUSER. A device to spread out or disperse material in various directions. [29]

DIKE. A bank of earth or stone used to form a barrier, frequently and confusingly interchanged with Levee, definition 1. A dike restrains water within an area that is normally flooded. [1]

DIPFILE. An automated Discrete Independent Point File maintained by Marine Chart Branch off-line from the AIS which lists charting sources and geographic positions of cartographic features such as navigational aids, landmarks, wrecks and obstructions. [29]

DIRECT ACCESS. (1) (ISO) The facility to obtain data from storage devices or to enter data into a storage device in such a way that the process depends only on the location of that data and not on a reference to data previously accessed. (2) Contrast with serial access. [20]

The ability to read or write information at any location within a storage device in a constant amount of time. Every site available for data storage on a direct-access device is identified by its own unique, numeric address. [34]

DIRECTION (SURVEYING AND MAPPING). The angle between a line or plane and an arbitrarily chosen reference line or plane. At a triangulation station, observed horizontal angles are reduced to a common reference line, and are called horizontal directions. They are usually collected into a single list of directions, starting with the 0° direction followed by the other directions in increasing clockwise order. [39]

DIRECTIONAL LIGHT. A light illuminating a sector or very narrow angle and intended to mark a direction to be followed. [37]

DIRECTION LIGHT. A light illuminating a sector of very narrow angle and intended to mark a direction to be followed. A direction light bounded by other sectors of different characteristics which define its margins with small angles of uncertainty is called a single station range light. [1]

DISC, DIGITAL. A rotating magnetic disc storage device for digital information used for relatively fast data access in computers. [22]

DISCHARGE. Includes, but is not limited to, any spilling, leaking, pouring, pumping, emitting, emptying, or dumping. [2]

DISCOLORED WATER. Unnatural colored areas in the sea due to the existence of shoals. Sea water having a color other than the blues and greens normally seen. Variations of the colours red, yellow, green, and brown, as well as black and white, have been reported. Discolorations may appear in patches, streaks, or large areas and may be caused by concentrations of inorganic or organic particles or plankton. See Red Tide. [17]

DISCONTINUED. To remove from operation (permanently or temporarily) a previously authorized aid. [37]

DISCREPANCY. Failure of an aid to maintain its position or function as prescribed in the Light List. [37]

DISCREPANCY BUOY. An easily transportable buoy used to temporarily replace an aid to navigation not watching properly. [37]

DISCREPANCY PRINT (PHOTOGRAMMETRY). The discrepancy print is a paper copy of the compilation manuscript at manuscript scale. It shows the compiler's notes concerning areas to be investigated by the field editor. [31]

DISCRETIONARY FUNCTION EXCEPTION. One of the exceptions in the Federal Tort Claims Act for which the Government is relieved from liability if the claim is based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or employee, whether or not the discretion involved is abused. See Federal Tort Claims Act. [3]

DISK (OR DISC). See Magnetic Disk. [22]

DISK DRIVE. (1) (ISO) A mechanism for moving a disk pack or a magnetic disk and controlling its movement. (2) (ISO) Deprecated term for magnetic disk unit. [20]

Typical disk drives are highly reliable, random access, movinghead memory devices, compactly designed for use as peripheral units in large, small and now, microcomputer systems. Typically a photoelectric positioning system, working in conjunction with a velocity transducer and voice coil driven actuator, provides fast and accurate head positioning over a wide temperature range. Cartridge interchangeability is becoming standard. A typical dual platter disk drive utilizes one permanent disk and one removable cartridge to provide 4.9 million bytes of storage. Some reliable drives have an average access time of less than 30 milliseconds, and a data transfer rate of 2.5 million bits per second. [34]

A device which rotates a disk or disk pack past the read/write heads (which may also be movable), so that data can be stored or extracted (read). [22]

DISKETTE (ISO). A flexible magnetic disk enclosed in a protective container. Synonymous with flexible disk. [20]

A thin, flexible platter (floppy disk) coated with magnetic material used as the storage medium in a floppy disk unit. [34]

DISK, MAGNETIC. A storage device on which information is recorded on the magnetizable surface of a rotating disk. A magnetic disk storage system is an array of such devices, with associated reading and writing heads which are mounted on movable arms. Related to (storage, disk). [24]

DISK PACK. (1) (ISO) A removable assembly of magnetic disks. (2) A portable set of flat, circular recording surfaces used in a disk storage device. [20]

A set of magnetic disks which have been designed so they can be placed in a processing device for reading and writing. Their design permits them to be interchanged with other disk packs. [34]

Several magnetic disks forming a unit, which is usually removable from the disk drive. [22]

DISMAL. A swamp bordering on, or near, the sea, often enclosing knobs or hummocks; a pocosin. Local in South Atlantic States. [4]

DISPLACEMENT. The horizontal shift of the plotted position of a feature from its true position, caused by the required adherence to line weights and symbol sizes. [21]

DISPLAY. (1) (ISO) A visual presentation of data. This term pertains to the act of presentation as well as the result. (2) (ISO) to present data visually. (3) See Cathode Ray Tube Display. [20]

An output device that produces a visible representation of a data set for visual access; usually the primary hardware component is a cathode ray tube. [23]

(1) A display device. (2) A visual representation of data, not to be taken away from the device like a printer or plotter output. (3) To generate a visual representation of data. [22]

DISPLAY, DIRECT. A visual display unit used to display data in graphical form directly from memory. [22]

DISPOSAL AREA. Area designated by the Corps of Engineers for depositing dredged material where existing depths indicate that the intent is not to cause sufficient shoaling to create a danger to surface navigation. Disposal areas are shown on nautical charts. See also dumping ground, dump site, spoil area. [1]

DISTANCE FINDING STATION (DFS). An attended light station or lightship emitting simultaneous radio and sound signals as a means of determining distance from the source of sound, by measuring the difference in the time of reception of the signals. The sound may be transmitted through either air or water or both and either from the same location as the radio signal or a location remote from it. The travel time of the radio signal is negligible compared to that of the sound signal. [1]

DISTANCE MEASURING EQUIPMENT, RADIO. Distance-measuring equipment that determines the distance between two points by sending radio waves (waves longer than 0.3 mm) from the one point to the other and (usually) back, and either measuring the difference in phase between the outgoing and returned waves or by measuring the difference in time between emission and return of a group of waves.

Equipment for measuring distances to objects high above the Earth's surface, such as aircraft, artificial satellites, or planets, is usually at a fixed location, and uses considerable power and pulsed radiation. It usually also measures direction. Such equipment is called radar. Small radars are mounted in aircraft for measuring the altitude of the aircraft or for obtaining the profile of the terrain. The principal exception to use of pulsed radiation is the radio interferometer, which does not measure distance but differences in phase. [39]

DISTRICT COMMANDER. "District Commander" as used in this part, means the officer of the Coast Guard designated by the Commandant to command a Coast Guard District. [2]

DIURNAL. Having a period or cycle of approximately 1 tidal day. Thus, the tide is said to be diurnal when only one high water and one low water occur during a tidal day, and the tidal current is said to be diurnal when there is a single flood and a single ebb period in the tidal day. A rotary current is diurnal if it changes its direction through all points of the compass once each tidal day. A diurnal constituent is one which has a single period in the constituent day. The symbol for such a constituent is usually distinguished by the subscript 1. See Type of Tide. [7]

DIVIDE. The line of separation between drainage systems; the summit of an interfluve. The highest summit of a pass or gap. [4]

DMS. The equivalents in meters of the seconds of latitude of triangulation stations; meridional differences. See Dps. [3]

DOCK. (1) The slip or waterway between two piers, or cut into the land for the berthing of ships. A pier is sometimes erroneously called a dock. Also called Slip. See also Jetty; Landing, definition 1; Quay; Wharf. (2) A basin or enclosure for reception of vessels, and provided with means for controlling the water level. A wet dock is one in which water can be maintained at various levels by closing a gate when the water is at the desired level. A dry dock is a dock providing support for a ship, and means of removing the water so that the bottom of the ship or other craft can be exposed. A dry dock consisting of an artificial basin is called a graving dock; one consisting of a floating structure is called a floating dock. (3) Used in the plural, a term used to describe area of the docks, wharves, basins, quays, etc. To place in a dock. [1]

DOCK, FLOATING. A form of dry dock consisting of a floating structure of one or more sections which can be partly submerged by controlled flooding to receive a vessel, then raised by pumping out the water so that the vessel's bottom can be exposed. [17]

DOCK SILL. The foundation at the bottom of the entrance to a dry dock or lock against which the caisson or gates close. The depth of water controlling the use of the dock or lock is measured from the sill to the surface. [1]

DOCK, WET. A dock in which water can be maintained at any level by closing a gate when the water is at the desired level. [17]

DOCUMENTATION. (1) (ISO) The management of documents which may include the actions of identifying, acquiring, processing, storing, and disseminating them. (2) (ISO) A collection of documents on a given subject. (3) The aids provided for understanding the structure and intended uses of an information system or its components, such as flowcharts, textual material, and end-user manuals. [20]

(1) The process of collecting, organizing, storing, citing and dispensing of documents of the information recorded in the documents. (2) The group of techniques necessary for the orderly presentation, organization, and communication of recorded specialized knowledge in order to maintain a complete record of reasons for changes in variables. Documentation is necessary not so much to give maximum utility as it is to give an unquestionable historical-reference record. [34]

The group or techniques necessary for the orderly presentation, organization and communication of recorded specialized knowledge, in order to maintain a complete record of reasons for changes in variables. Documentation is necessary not so much to give maximum utility as to give an unquestionable historical reference record. [24]

DOG EAR. A small section of paper added to the boat sheet when it is necessary to use a control point which falls a short distance beyond the limits of the sheet as originally laid out. [17]

DOG LEG. A leg which does not lead directly to the destination or way point. It is followed to comply with established procedures, avoid possible dangers or bad weather, delay time of arrival, etc. [1]

DOLPHIN. A mooring post or buffer placed at the entrance of a dock, alongside a wharf or in the middle of a stream. In the first and second instances it is used as a buffer. In the third it is used as a mooring post by vessels which discharge their cargoes without going alongside a dock or wharf. Each dolphin is generally composed of a series of heavy piles contiguous to each other. They are arranged in a circle, brought together and capped over the top. [36]

Is a very substantial post, group of posts or structure used for mooring or hauling off vessels or for the protection of other ships or constructions. It is usually located in the water. [16]

A post or group of posts, used for mooring or warping a vessel. The dolphin may be in the water, on a wharf, or on the beach. [1]

DOME. A label on a nautical chart which indicates a large, rounded, hemispherical structure rising from a building or a roof of the same shape. A prominent example is that of the Capitol of the United States in Washington, D.C. [1]

A smoothly rounded, rock-capped mountain summit, roughly resembling the dome or cupola of a building. [4]

DOPPLER NAVIGATION. Navigation that obtains the craft's velocity from observations of Doppler shift in a received signal. Two kinds of equipment are in use for this kind of navigation. The first kind consists of beacons emitting signals at known frequencies which are established at fixed points of known location; the moving vehicle measures the difference between the frequency of the signal it receives and that of the emitted signal. In the second kind, the craft itself carries the emitter. Here the radiation emitted is reflected from the ground or ocean bottom and is recorded by a receiver on board the craft. [39]

DOT AREA. A halftone pattern consists of dots and the clear spaces between them. Their percentage of the area which is occupied by the dots (which may consist of developed silver, printing ink, etc.) is known as the "percentage of dot area." Thus, in the case of a "checkerboard" pattern, the dot area would be 50 percent. [37]

DOUBTFUL SOUNDING. Of uncertain depth. The expression, as abbreviated, is used principally on charts to indicate a position where the depth may be less than indicated, the position not being in doubt. [1]

DOWN TIME (ISO). The time during which a functional unit cannot be used owing to a fault. Down time can result from a fault within the functional unit or from an environmental fault; in the former case, the down time equals the inoperable time. [20]

The period during which a computer is malfunctioning or not operating correctly due to machine failures. (Contrasted with available time, idle time, or standby time.) [34]

DPS. The equivalents in meters of the seconds of longitude of triangulation stations; parallel differences. See Dms. [3]

DRAFT (OR DRAUGHT). The vertical distance, at any section of a vessel from the surface of the water to the bottom of the keel. When measured at or near the stem, it is referred to as draft forward and when measured at or near the stern as draft aft. The mean draft is the mean of the drafts forward and aft. These drafts are more specifically described as displacement drafts as opposed to navigational drafts which are measured to the lowest appendage to the hull as opposed to the keel. [17]

The depth to which a vessel is submerged. Draft is customarily indicated by numerals called Draft Marks at the bow and stern. It may also be determined by means of a draft gauge. [1]

DRAG. (1) To tow a line or object below the surface, to determine the least depth in an area or to insure that a given area is free from navigational dangers to a certain depth. Drag and Sweep have nearly the same meanings. Drag refers particularly to the location of obstructions, or the determination that obstructions do not exist. Sweep may include, additionally, the removal of any obstructions located. [1]

DRAIN. A channel; a trench; a watercourse, especially a narrow one. [4]

DRAWBRIDGE. A bridge that can be raised, lowered, or drawn aside.

DRAWING. An impression following the printing of a nautical chart of either its black or its magenta detail on matte finish transparent plastic, used in revising subsequent printings of the chart. [17]

DRAWING-AID PROOF. A Drawing-Aid Proof is a plastic copy of the chart black plate and is the medium upon which cartographic compilation (addition, deletion, revision) is applied from source documents on all new print charts and certain less major reconstructed charts. [29]

DREDGED MATERIAL. The term "dredged material" means any material excavated or dredged from navigable waters of the United States. [2]

DRUM PLOTTER (ISO). A plotter that draws a display image on a display surface mounted on a rotating drum. [20]

A plotter which makes use of a rotating drum or cylinder to move the sheet of paper or film on which the image is created in the direction of coordinate axis (e.g., x) while the plotting head or beam only moves along the other coordinate direction (e.g., y). Contrast with "flatbed plotter." [22]

DRY DOCK. An artificial basin fitted with gate or caisson into which a vessel may be floated and from which the water may be pumped out to expose the bottom of the vessel. (Sometimes referred to as a graving dock.) [4]

An enclosed basin into which a ship is taken for underwater cleaning and repairing. It is fitted with watertight entrance gates which when closed permit the dock to be pumped dry. In modern dry docks the gates opening in the middle and hinged at sides having been replaced by a caisson or pontoon that fits closely into the entrance. The caisson is flooded and sunk in place, and can be pumped out, floated and warped away from the dock entrance to permit passage of vessels. Also called graving dock, graving dry dock. [36]

DRY HARBOR. A small harbor which either dries at low water or has insufficient depths to keep vessels afloat during all states of the tide. Vessels using it must be prepared to take the ground on the falling tide. [1]

DRYING HEIGHTS. Heights above chart sounding datum of those features which are periodically covered and exposed by the rise and fall of the tide. [1]

DRY WASH. A wash, arroyo, or coulee in the bed of which there is no water, except at infrequent intervals and for short periods. [4]

DUCK BLIND. For NOS charting purposes, a duck blind is a nonfloating structure, used for concealing waterfowl hunters, usually consisting of a wooden framework covered with brush. Duck blinds pose a special problem to the NOS charting program. They are essentially unreported to any charting authority when built. They are unlighted and often constructed in navigable water without regard to the possible hazard they pose, especially to the small craft operator. Many are substantial structures built on piles. Even after they are eventually reduced to ruins the pilings may persist for years. [31]

DUMP. (1) (ISO) Data that have been dumped. (2) (ISO) To write the contents of a storage, or of part of a storage, usually from an internal storage to an external medium, for a specific purpose such as to allow other use of the storage, as a safeguard against faults or errors, or in connection with debugging. [20]

(1) To accidentally or intentionally withdraw all power from a computer. (2) To record the contents of internal storage at a given instant of time usually as an aid in detecting program mistakes or errors. (3) To print out or punch out a portion or all of the contents of the computer memory. (4) To transfer all or part of the contents of one section of computer memory into another section, or to some output device. [34]

DUMPING GROUNDS. Although shown on nautical charts as dumping grounds in United States waters, the Federal regulations for these areas have been revoked and their use for dumping discontinued. These areas will continue to be shown on nautical charts until such time as they are no longer considered to be a danger to navigation. See also Dump Site, Spoil Area, Disposal area. [1]

DUMP SITE. Area established by Federal regulation in which dumping of dredged and fill material and other nonbuoyant objects is allowed with the issuance of a permit. Dump sites are shown on nautical charts. See also disposal area, dumping ground, spoil area. [1]

DUNE. A hill or ridge formed by the wind from sand or other granular material. [4]

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E

EBB. Tidal current moving away from land or down a tidal stream. The opposite is flood. Sometimes the terms Ebb and Flood are also used with reference to vertical tidal movement, but for this vertical movement the expressions falling tide and rising tide are considered preferable. Also called ebb current. [1]

EBB CURRENT. The tidal current associated with the decrease in the height of a tide. Ebb currents generally set seaward, or in an opposite direction to the tide progressing. Erroneously called ebb tide. [12]

The movement of a tidal current away from shore or down a tidal river or estuary. In the mixed type of reversing tidal current, the terms greater ebb and lesser ebb are applied respectively to ebb tidal currents of greater and lesser speed each day. The terms maximum ebb and minimum ebb are applied to the maximum and minimum speeds of a current running continuously ebb, the speed alternately increasing and decreasing without coming to a slack or reversing. The expression maximum ebb is also applicable to any ebb current at the time of greatest speed. [7]

EBB TIDE. The portion of the tide cycle between high water and the following low water. Also called falling tide. [10]

ECHOGRAM. (1) The graphic presentation of echo soundings recorded as a continuous profile of the bottom. (2) Often erroneously called a fathogram when not recorded by a fathometer. [12]

ECHO SOUNDER. An instrument for determining the depth of water by measuring the time interval between the emission of a sonic or ultrasonic signal and the return of its echo from the bottom. Also called echo sounding instrument (or apparatus), sonic depth finder, or ultrasonic depth finder, as appropriate. See Echo Sounding. [17]

ECHO SOUNDING. A method of measuring the depth of water by determining the time required for sound waves to travel, at a known velocity, from the survey vessel to the bottom and return. [3]

ECLIPSE. A phase of the characteristic of a flashing light during which the light is not exhibited. [37]

EGRESS. In the law of riparian rights, the right of access to navigable water which a riparian owner enjoys. [3]

EDIT (ISO). To prepare data for a later operation. Editing may include the rearrangement or the addition of data, the deletion of unwanted data, format control, code conversion, and the application of standard processes such as zero suppression. [20]

(1) To prepare for publication. (2) To rearrange data or information. Editing may involve the deletion of unwanted data, the selection of pertinent data, the application of format techniques, the insertion of symbols such as page numbers and typewriter characters, the application of standard processes such as zero suppression, and the testing of data for reasonableness and proper range. Editing may sometimes be distinguished between input edit (arrangement of source data) and output edit (preparation of table formats.) [34]

To prepare data for a later operation. This may involve the rearrangement, correction or annotation of data, the deletion of unwanted data, format and/or code conversion, and the layout for printing, plotting or displaying the data. [22]

EDITING. The process of checking a map or chart in its various stages of preparation to insure accuracy, completeness, and correct preparation from the interpretation of the sources used, and to assure legible and precise reproduction. Edits are usually referred to by a particular production phase, such as compilation edit, scribing edit, etc. [10]

Revising a data field within a data record (e.g., changing the geographic position) -- this is never done at an AIS central site workstation. [32]

EDIT PLOT. A preliminary plot of a cartographic digital file for use in editing map detail prior to production of final display or plot. [22]

EDDY. A current of water running contrary to the main current or moving circularly; a whirlpool. [4]

A quasi-circular movement of water whose area is relatively small in comparison to the current with which it is associated. Eddies may be formed between two adjacent currents flowing counter to each other and where currents pass obstructions, especially on the downstream side. [1]

ELECTRON BEAM RECORDER. A plotter-like device that records graphic images on film by exposing a special electron-sensitive film in a vacuum chamber directly to a beam of electrons (as used in a CRT). This technique results in very high resolution drawings (about 3 microns line width) at very high speeds on standard roll film formats which are then enlarged for printing. [22]

ELECTRONIC AID TO NAVIGATION. An aid to navigation using electronic equipment. If the navigational information is transmitted by radio waves, the device may be called a radio aid to navigation. [1]

ELECTRONIC NAVIGATION. Navigation by means of electronic equipment. The expression electronic navigation is more inclusive than radionavigation, since it includes navigation involving any electronic device or instrument. Because of the extent of the use of electronics in navigation equipment other than those depending upon information transmitted or received by radio waves, the term electronic navigation has limited value as a term for division of navigation. [1]

ELECTROSTATIC PLOTTER (DOT MATRIX PRINTER/PLOTTER). A raster plotter which can also print characters consisting of small dots in a matrix. The graphic is created by means of electrostatic charging of the medium to be plotted upon at those areas where an image should appear, and subsequent depositing of charged dust-like material, called "toner." [22]

ELECTROSTATIC PRINTING. A system of printing which employs electrostatic forces to apply the image. [21]

ELEVATIONS. Heights of natural and artificial objects above an adopted reference plane. On nautical charts of the National Ocean Service the elevations of bare rocks, bridges, landmarks, and lights are referenced to the plane of mean high water; contour and summit elevations are referenced to mean sea level, if the source for such information is referenced to this plane. All elevations are in feet. [3]

The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level. The term elevation is sometimes used synonymously with altitude which in modern use refers particularly to the distance of points or objects above the earth's surface. An area higher than its surroundings, as a hill. [17]

The distance of a point above a specified surface of constant potential; the distance is measured along the direction of gravity between the point and the surface. The surface usually specified is the geoid or an approximation thereto. Mean sea level was long considered a satisfactory approximation to the geoid and therefore suitable for use as a reference surface. It is now known that mean sea level can differ from the geoid by up to a meter or more, but the exact difference is difficult to determine. The terms height and level are frequently used as synonyms for elevation. In geodesy, height also refers to the distance above an ellipsoid; it is used in this sense in this glossary, except where custom has established a different usage. "Level" has such a variety of meanings that it is best not to use the term to mean elevation. See also Altitude. [39]

The elevation of a light is the vertical distance between the light source and sea level... The elevation shall be measured from mean sea level where there is little appreciable tide at the adjacent shoreline. Elsewhere, an appropriate High Water datum shall be used. The height of a light structure is the vertical distance between its top and ground level and shall not normally be shown on charts.

To a mariner, the significance of a charted elevation may be: In estimating or looking up the distance at which a landfall light should first be sighted (the elevation becomes more important as charted geographical ranges are replaced by luminous ranges). In identifying particular lights, e.g, leading lights, where they could be confused with other lights. In warning him that a light is at a great elevation and is more likely to be obscured by cloud than one at a lower elevation. In enabling distance off a headland to be calculated, by day, if radar or other aids are not available. It follows that the elevations of landfall lights should be charted, at least on the largest scales. Elevations of other lights where the elevation seems significant, e.g., leading lights, should also be charted on the largest scales. The elevations of minor lights are of little significance and should be omitted from charts. [16]

EMBANKMENT. An artificial deposit of material that is raised above the natural surface of the land and used to contain, divert, or store water; support roads or railways; or for other similar purposes. [23]

EMBAYMENT. Any indentation of a coast regardless of width at the entrance or depth of penetration into the land. See Inland Waters. [3]

EMISSION DELAY. (1) A delay in the transmission of a pulse signal from a slave (or secondary) station of a hyperbolic radionavigation system, introduced as an aid in distinguishing between master and slave (or secondary) station signals. (2) In LORAN-C the time interval between the master station's transmission and the secondary station's transmission in the same group repetition interval (GRI). The GRI is selected of sufficient duration to provide time for each station to transmit its pulse group and additional time between each pulse group so that signals from two or more stations cannot overlap in time anywhere within the coverage area. In general, emission delays are kept as small as possible to allow the use of the smallest GRI. [1]

EMULSION. The light-sensitive coating of a photographic material, mainly silver salts suspended in gelatin. [28]

EMULSION-TO-EMULSION. A contact exposure in which the emulsion of the copying film is in contact with the emulsion of the sheet being copied. [28]

ENCLAVE. An area of high seas partly or entirely within the territorial sea. [3]

END-OF-TAPE MARKER (EOT) (ISO). A marker on a magnetic tape used to indicate the end of the permissible recording area, e.g., a photo reflective strip, a transparent section of tape. [20]

ENGRAVING. The act, process or art of cutting or etching designs or letters on metal plates, wooden blocks, etc. for printing. Any printed impression made from an engraved surface. [17]

ENTRANCE LOCK. A lock between the tideway and an enclosed basin when their water levels vary. By means of the lock, which has two sets of gates, vessels can pass either way at all states of the tide. Also called Tidal Lock. See also Non-Tidal Basin. [1]

ENTRY POINT. (1) (ISO) The address or the label of the first instruction executed upon entering a computer program, a routine, or a subroutine. A computer program, a routine, or a subroutine may have a number of different entry points, each perhaps corresponding to a different function or purpose. Synonymous with entrance, entry. (2) In a routine, any place to which control can be passed. [20]

(1) Most subroutines have specific points or places where control can be transferred and reentered. The entry point usually corresponds to a new or different function to be performed. (2) Usually the first instruction to be executed in a subroutine or as part of the entry conditions for specific computers or installations. Various subroutines may have a number of different entry points corresponding to different programs, subroutines, or their

functions. When an instruction of a subroutine designates a place or point for reentering, it becomes the re-entry point of the major program. [34]

EPHERMERIS. A tabulation of the locations and related data for a celestial body for given epochs (dates) at uniform intervals of time. In particular, a publication containing such data for a number of celestial bodies. The Astronomical Almanac is an example. [39]

EPOCH. As used in tidal datum determinations, it is a 19-year Metonic cycle over which tidal height observations are meaned in order to establish the various datums. As there are periodic and apparent secular trends in sea level, a specific 19-year cycle (the National Tidal Datum Epoch) is selected so that all tidal datum determinations throughout the United States and its possessions will have a common reference. The National tidal Datum Epoch officially adopted by the National Ocean Service is 1941 through 1959. The National Tidal Datum Epoch will be reviewed for consideration for possible revision at 25-year intervals. [7]

ERASE (ISO). To remove data from a data medium leaving the medium available for recording new data. [20]

To replace all the binary digits in a storage device by binary zeros. In a binary computer, erasing is equivalent to clearing. In a coded-decimal computer where the pulse code for decimal zero may contain binary ones, clearing leaves decimal zero while erasing leaves all-zero pulse codes. [34]

ESCARPMENT. An extended line of cliffs or bluffs; a high steep face of rock; an elongated and comparatively steep slope of the sea floor, separating flat or gently sloping areas. [4]

ESTABLISH. To place an authorized aid in operation for the first time. [37]

ESTABLISHED DIRECTION OF TRAFFIC FLOW. A traffic flow pattern indicating the directional movement of traffic as established within a traffic separation scheme. [19]

ESTUARY. An embayment of the coast in which fresh river water entering at its head mixes with the relatively saline ocean water. When tidal action is the dominant mixing agent it is usually termed a tidal estuary. Also, the lower reaches and mouth of a river emptying directly into the sea where tidal mixing takes place. The latter is sometimes called a river estuary. [7]

ETCH. To form an image within the surface of a printing or drawing material by the use of solvents. [17]

To move selected areas of emulsion either chemically or manually. Chemical treatment of a lithographic plate to make nonprinting areas grease-repellent and water-receptive or to produce the image on deep-etch plates. An acid solution mixed with the dampening fountain water on an offset press to help control ink on the pressplate. [25]

EVALUATION REPORT. Successor to the Verifier's Report with format and content essentially unchanged. See Verifier's Report and Review Report. [40]

EVERGLADE. A tract of swampy land covered mostly with tall grass; a swamp or inundated tract of low land. Local in the South. [4]

A marshy tract of land mostly under water and covered in places with tall grass; chiefly in plural as the name of a large swampy region of South Florida. [17]

EXCLUSIVE ECONOMIC ZONE. The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United Nations Trusteeship Agreement), and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. In cases where the maritime boundary with a neighboring State remains to be determined, the boundary of the Exclusive Economic Zone shall be determined by the United States and other State concerned in accordance with equitable principles. Within the Exclusive Economic Zone, the United States has, to the extent permitted by international law, (1) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and non-living, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment. This does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction and require international agreements for effective management.

Without prejudice to the sovereign rights and jurisdiction of the United States, the Exclusive Economic Zone remains an area beyond the territory and territorial sea of the United States in which all States enjoy the high seas freedoms of navigation, overflight, the laying of submarine cables and pipelines, and other internationally lawful uses of the sea. [29]

EXECUTE. (1) (ISO) In programming, to change the state of a computer in accordance with the rules of the operations it recognizes. (2) (ISO) To perform the execution of an instruction or of a computer program. [20]

To carry out an instruction or perform a routine. To interpret a machine instruction and perform the indicated operation(s) on the operand(s) specified. [34]

EXECUTION (ISO). The process of carrying out an instruction or the instructions of a computer program by a computer. [20]

EXERCISE AREA. An area shown on charts within which naval, military or aerial exercises are carried out. Also called military practice area. [17]

EXISTENCE DOUBTFUL. Of uncertain existence. The expression is used principally on charts to indicate the possible existence of a rock, shoal, etc., the actual existence of which has not been established. Usually shown by the abbreviation 'E.D.'. [17]

EXIT (ISO). Any instruction in a computer program in a routine, or in a subroutine after the execution of which control is no longer exercised by that computer program, that routine, or that subroutine. [20]

(1) The time or place at which the control sequence ends or transfers out of a particular program or subroutine. (2) A way of momentarily interrupting or leaving a repeated cycle of operations in a program. [34]

EXTINGUISHED. A lighted aid which has failed to show a light signal. [37]

EXTREME HIGH WATER. The highest elevation reached by the sea as recorded by a tide gage during a given period. The National Ocean Service routinely documents monthly and yearly extreme high waters for its control stations. [7]

EXTREME LOW WATER. The lowest elevation reached by the sea as recorded by a tide gage during a given period. The National Ocean Service routinely documents monthly and yearly extreme low water for its control stations. [7]

As part of the tide note included on the nautical charts, it is the value of the lowest water level observed or estimated for the limits of the chart. It may be based on the lowest water level observed at a tide station over a short period or a long period, or it may be an estimated value based on the best available reports and information. It is not a recognized tidal plane and should not be confused with the lowest tide resulting primarily from astronomic causes. [3]

EXTRUSION (BORDER BREAK). The extension of detail outside the neat line. [21]

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F

FAIRWAY. That part of a river, harbor, and so on, where the main navigable channel for vessels of larger size lies. The usual course followed by vessels entering or leaving harbor. Also called ship channel. The word "fairway" has been generally interpreted to include any navigable water on which vessels of commerce habitually move, and, therefore, embraces the water inside channel buoys where light-draft vessels frequently navigate and not merely the ship channel itself. [36]

FAIRWAY BUOY. A buoy marking the fairway in a channel. They are painted in black and white or red and white vertical stripes. Also called mid-channel buoys. [36]

FALL (FALLS). A cascade, waterfall, or cataract; the flow or descent of one body of water into another. (Usually pl.) [4]

FALSE ORIGIN. A fixed point to the south and west of a grid zone from which grid distances are measured eastward and northward. See also Grid Origin. [10]

FAN. A gently sloping, cone-shaped accumulation of material normally located at the mouth of a canyon. [4]

FAST LAND. Land inshore of the inner edge of a marsh; usually at or above the plane of mean high water. [3]

FAST SHORELINE. The term "fast shoreline" refers to the line appearing on a shoreline map that separates water from fast, natural uplands. This line should not be confused with the approximate back limits of marsh or marine vegetation which is normally compiled shoreward from an apparent shoreline and in lieu of the fast shoreline. [31]

FATHOGRAM. (1) The graphic presentation of the bottom profile determined by a Fathometer. (2) Often erroneously applied to any echogram. [12]

FATHOM. The common unit of depth in the ocean for countries using the English system of units, equal to 6 feet (1.83 meters). It is also sometimes used in expressing horizontal distances, in which case 120 fathoms make one cable or very nearly 1-tenth nautical mile. [12]

FATHOMETER (U.S.A.). The trade name for an Echo Sounder 808 Fathometer is a semi-portable, supersonic, graphic recording instrument designed for Hydrographic Surveys in shallow to moderately deep water from vessels of all sizes. Its range is from about 1 to 300 metres. [17]

FAULT. In geology, a break of shear in the earth's crust with an observable displacement between the two sides of the break, and parallel to the plane of the break. [17]

FEATURE. See Cartographic Feature. Sometimes also applied to the digital description of a cartographic feature. [22]

FEATURE CODE. An alphanumeric code (label) attached to all point, line or area data describing a cartographic feature of particular quality. [22]

FEATURE RECORD. A record containing data that describe part or all of a particular cartographic feature. [22]

FEDERAL PROJECT DEPTH. The design dredging depth of a channel constructed by the Corps of Engineers, U.S. Army; the project depth may or may not be the goal of maintenance dredging after completion of the channel. For this reason federal project depth must not be confused with controlling depth. [1]

FEDERAL TORT CLAIMS ACT. An act passed in 1946 as Title IV of the omnibus Legislative Reorganization Act by which the United States waived its sovereign immunity from suits for injury caused by the negligent act of a federal employee and permitted claims to be brought against it under certain specified conditions. [3]

FERRYBOAT. A vessel in which passengers and goods are conveyed over narrow waters. [36]

FIELD. (1) (ISO) In a record, a specified area used for a particular category of data, e.g., a group of card columns in which a wage rate is recorded. (2) Defined logical data that is part of a record. [20]

A set of one or more characters (not necessarily all lying on the same word) which is treated as a whole; a set of one or more columns on a punched card consistently used to record similar information. [34]

In a record, a specified area used for a particular category of data, e.g., a group of card columns used to represent a wage rate or a set of bit locations in a computer word used to express the address of the operand. [22]

FIELD EDIT. As defined in this text, is the process of on site examinations and measurements designed to ensure that detail and nomenclature, as portrayed or described on previously compiled documents, is current, reliable, and adequate for its intended purpose. The purpose of these documents, which may be in graphic or tabulated form, is to provide data for the nautical charting program.

Field edit is closely associated with photogrammetric products and procedures. Modern chart production relies heavily on information taken from aerial photographs. A fundamental tool in the field edit operation is a stable base reproduction (sheet) of the photogrammetrically compiled shoreline manuscript. All field edit additions, deletions and changes are either made directly or referenced on this sheet. In addition, an annotated paper copy of the shoreline manuscript alerts the editor to all known or suspected discrepancies relating to the project. These discrepancies may come from existing nautical charts or from any other chart source data. Photogrammetric methods usually present the most efficient and sometimes the only feasible way of effecting necessary field edit changes.

Field edit can be thought of as consisting of four basic operations. First, all photogrammetrically compiled data is verified for position and nomenclature. Second, the

editor must properly dispose of all notes to the editor as annotated on a copy of the shoreline manuscript. Third, positions and descriptions of landmarks and fixed aids to navigation must be verified or determined. Fourth, the editor must ensure that all information significant to the use of the proposed chart has been properly recorded or referenced on a field edit document. [31]

FIELD EXAMINATION. A special purpose NOS hydrographic, wire drag, or side scan sonar survey of very limited area; i.e., usually an investigation of one or more individual and scattered items. [40]

FIELD INSPECTION. Initial field operation in the preparation (through modern techniques employing aerial photogrammetry) of a map or chart scheduled before the start of manuscript compilation and intended to provide information needed to correctly interpret photographic images, hues, and tones. The inspection provides data not obtainable from photographs. Development of new materials and methods in recent years has reduced the scope of field inspection and, in some cases, has made it unnecessary.[25] Surveying is not a part of field inspection but, together with field inspection, constitutes field completion. [29]

FIELD SHEET. The hydrographer's or topographer's work sheet; it presents a graphic display of all surface and subsurface features in the area being surveyed. See also Boat Sheet. [10]

FILE. (1) (ISO) A set of related records treated as a unit, e.g., in stock control, a file could consist of a set of invoices. [20]

A collection of related records treated as a unit. In a computer system a file can exist on magnetic tape, disk punched paper tape, punched cards or as an accumulation of information in system memory. A file can contain data programs, or both [34]

An organized collection of information directed toward some purpose. The records in a file may or may not be sequenced according to a key contained in each record. [24]

Sequential collection of records terminated by an "end of file" mark. [22]

FILE LAYOUT (ISO). The arrangement and structure of data or words in a file including the order and size of the components of the file. [20]

FILE MAINTENANCE (ISO). The activity of keeping a file up to date by adding, changing, or deleting data. [20]

Modification of a file to incorporate changes that do not involve arithmetical operations; for example, insertions, deletions, transfers, and corrections. [34]

FILL MATERIAL. The term "fill material" means any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of an waterbody. The term does not include any pollutant discharged into the water primarily to dispose of waste, as that activity is regulated under Section 402 of the Clean Water Act. [2]

FILM NEGATIVE. (1) A photographic image on film, plate, or paper, in which the tones are reversed. (2) A film, plate, or paper containing such a reversed image. [23]

FILM POSITIVE. (1) A photographic image having approximately the same rendition of light and shade as the original subject. (2) A film, plate, or paper containing such an image. [23]

FILTERING. This is the process of selecting specific data within a specific source document for chart application. Filtering can take several forms. For initial load into the AIS and until digital continual maintenance is achieved, documents are applied manually to the chart drawing before digitizing. This manual application is a form of filtering; shoreline is generalized or a selection of soundings is made. After digital continual maintenance is achieved, source documents will be precompiled before digitizing and only desired features will be marked for digitizing. This is another form of filtering. Both of these forms are cartographic decisions made by compilers. Filtering also takes place during AIS processing where software is used to test for undesirable data conditions and eliminate these conditions or that data (i.e., eliminating buoys from a hydrographic survey). Software filtering usually reflects organizational policy that can be applied universally to all data. This type of filtering is usually under the control of a Data Manager or Data Management Policy Committee. [32]

FINGER PIERS. Small piers which extend from a larger main pier. [15]

FIORD (OR FJORD). A long narrow arm of the sea, running up between high banks or cliffs, as on the coast of Norway. Often has a relatively shallow sill across its entrance. [17]

FIRST-ORDER WORK. The designation given survey work of the highest prescribed order of precision and accuracy. Such surveys were formerly called primary. [10]

FISH AGGREGATING DEVISED (FADS). Clusters of submerged hollow spheres tethered to a 5 foot diameter spherical survace buoy and cabled to heavy concrete blocks on the sea floor to hold them in suspension. FADs are deployed in depths of 480 to 9000 feet and at distances from 2 to fifteen miles off shore. They are primarily used in the waters off the Hawaiian Islands and to attract fish for commercial and recreational fishermen.

FISHERY CONSERVATION ZONE. See Fishing Zone. [1]

FISH HAVENS. Areas established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by dumping assorted junk in areas which may be of very small extent or may stretch a considerable distance along a depth contour. Fish havens are outlined and labeled on charts. Also called Fishery Reefs. [1]

FISHING GROUND. A water area in which fishing is frequently carried on. Also called fishing area or fishing zone. [17]

FISHING ZONE. The offshore zone in which exclusive fishing rights and management are held by the coastal nation. The U.S. fishing zone, known as the Fishery Conservation Zone, is defined under P.L. 94-265. The law states, "The inner boundary of the Fishery Conservation Zone is a line conterminous with the seaward boundary of each of the coastal states, and the outer boundary of such zone is a line drawn in such manner that each point on it is 200

nautical miles from the baseline from which the territorial sea is measured." [1]

FISH POUND. A fixed fish trap of the barrier type. Also called weir. It generally consists of a stone wall built across the mouth of a creek and of such height that it can be covered only at high spring tides. At one point there is an opening which can be closed, thus retaining any fish that made their way into the creek on flood tide. When the opening is closed the water can pass through a grating in the door and when the creek is dry the fish are collected. [36]

FISH (OR FISHING) STAKES. Poles or stakes placed in shallow water to outline fishing grounds or to catch fish. [17]

FISH TRAP. See Pound Net. [36]

FISH TRAP AREAS. Areas established by the Corps of Engineers in which traps may be built and maintained according to established regulations. The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fishtrap areas and a cautionary note are usually charted. [1]

FIX. A position determined without reference to any former position. In concept a fix is the common intersection of two or more lines of position obtained from simultaneous observations not dependent upon any former position. In normal practice a fix is the most probable position derived from two or more intersecting lines of position obtained from observations made at nearly the same time and advanced or retired to a common time, the lines when numbering three or more not intersecting at a common point because of the errors associated with each line. [1]

FIXED BRIDGE. A single or multiple span bridge without a movable span. It has fixed vertical and horizontal clearance.

FLAGPOLE. A label on a nautical chart which indicates a single staff from which flags are displayed. The term used when the pole is not attached to a building. The label flagstaff is used for a flagpole rising from a building. [1]

FLAGSTAFF. See Flagpole. [1]

FLAG TOWER. A label on a nautical chart which indicates a scaffold-like tower from which flags are displayed. [1]

FLASHING LIGHT. A light in which the total duration of light in a period is shorter than the total duration of darkness and appearances of light (flashes) are usually of equal duration. The term is commonly used for a single-flashing light, a flashing light in which a flash is regularly repeated (at a rate of less then 50 flashes per minute). [1]

FLASH TUBE. A discharge lamp, operated with electronic equipment, giving a high light output for a very brief period, capable of repetition. [37]

FLAT. A level tract lying at a small depth below the surface of water, or alternately covered and left bare by the tide ("tidal flat", "mud flat"). [4]

(1) A large flat area attached to the shore consisting usually of mud, but sometimes of sand and rock. Also called Tidal Flats. See also Salt Marsh, Slough. (2) On the sea floor, a small level or nearly level area. [1]

An assembly of photographic negatives or positives on goldenrod paper or vinyl acetate for contact exposure with a sensitized metal pressplate. May contain illustrations as well as text. [10]

FLAT-BED OFFSET PRINTING MACHINE. A printing machine composed of a rubber-covered cylinder resting over a reciprocal moving bed to which the printing plate is clamped. The image is transferred from the plate to the cylinder and thence to the paper or other printed surface. [21]

FLATBED PLOTTER (ISO). A plotter that draws a display image on a display of that data, draws the image while the data medium is stationary. [20]

A device that provides continuous line or point plotting of curves and data. [34]

A plotter which generates the graphic image on a medium mounted on a flat surface. Contrast with "drum plotter." [22]

FLOAT. A float is a floating structure, usually rectangular in shape, which generally serves as a landing or pierhead. [16]

FLOATING AID. A buoy, secured in its assigned position by a mooring. [37]

FLOATING BREAKWATER. A breakwater consisting of a series of logs or timbers chained or lashed together and secured by chains or cables attached to anchors or large blocks of stone, so as to form a protected basin for the mooring or anchoring of vessels. [15]

FLOATING DOCK. A form of dry dock consisting of a floating structure of one or more sections, which can be partly submerged by controlled flooding to receive a vessel, then raised by pumping out the water so that the vessel's bottom can be exposed. See also Graving Dock. [1]

A floating structure which can be submerged to receive a vessel, and then floated to expose the bottom of the vessel. [4]

FLOOD. Tidal current moving toward land or up a tidal stream. The opposite is EBB. Sometimes the terms Flood and EBB are also used with reference to vertical tidal movement, but for this vertical movement the expressions Rising Tide and Falling Tide are considered preferable. Also called Flood Current. [1]

The flood stream. Sometimes the term 'flood' is also used with reference to vertical tidal movement. The opposite is EBB.

An overflowing of water on land usually dry; inundation. [17]

FLOOD CURRENT. The movement of a tidal current toward the shore or up a tidal river or estuary. In the mixed type of reversing current, the terms greater flood and lessor flood are applied respectively to the flood currents of greater and lessor speed of each day. The terms maximum flood and minimum flood are applied to the maximum and minimum speeds of a flood current, the speed of which alternately increases and decreases without coming to a slack or reversing. The expression maximum flood is also applicable to any flood current at the time of greatest velocity. The opposite is ebb current. [1]

The tidal current associated with the increase in the height of a tide. Flood currents generally set toward the shore, or in the direction of the tide progression. Erroneously called flood tide. [12]

The movement of a tidal current toward the shore or up a tidal river or estuary. In the mixed type of reversing current, the terms greater flood and lesser flood are applied respectively to the two flood currents of greater and lesser speed of each day. The expression maximum flood is applicable to any flood current at the time of greatest speed. [7]

FLOODGATE. A gate for shutting out, admitting, or releasing a body of water; a sluice. [4]

FLOOD PLAIN. Belt of low flat ground bordering a stream channel that is flooded when runoff exceeds the capacity of the stream channel. [25]

FLOOR. The bed or bottom of the ocean. A comparatively level valley bottom; any low-lying ground surface. [4]

FLOPPY DISK. Deprecated term for diskette. [20]

A magnetic disk data storage device made of flexible (floppy) material. [22]

FOG DETECTOR. A device used to automatically determine conditions of visibility which warrant the turning on or off of a sound signal or additional light signals. [37]

FOG SIGNAL. Generic term for sound and wireless signals employed aboard ship and on shore stations in fog, mist, falling snow or heavy rainstorms. Fog signals may be classified as follows: (1) Sound signals transmitted through the atmosphere by sirens, whistles, diaphones, nautophones, bells, gongs, guns and detonating rockets. (2) Submarine signals such as submarine bells and oscillators. (3) Wireless signals from radio beacons. [36]

FOLIO CHARTS. These U.S. National Ocean Service charts consist of two to four sheets, are printed front and back, folded, and are bound in a protective cardboard jacket. [29]

FONT. Complete assortment of all the different characters of a particular size and style of type. [33]

FOOT. The bottom of a slope, grade or declivity. A term for the lower part of any elevated land form. [4]

(1) A unit of length defined to be 1/3 of a yard and equal in the United States of America,

since 1866, to exactly 1200/3937 of a meter. Also known as the survey foot. (2) A unit of length defined (for scientific purposes) by the 1959 agreement between the U.S. National Bureau of Standards and similar organizations in other countries to be 1/3 of the international yard, or exactly 0.3048 meter. Also known as the international foot. The foot used in the triangulation of Great Britain was defined as 1/10 of the length of the 10-foot bar 01 of the Ordnance Survey, and equal to 0.304800756 of an international meter. The Indian foot used by the United States and Great Britain for computing triangulation in India and neighboring countries is 0.30479842 meter. The foot used at present by the Survey of India is 0.3047996 meter. See also Yard. [39]

FOOTHILL. One of the lower subsidiary hills at the foot of a mountain, or of higher hills. (Commonly used in the plural.) [4]

FOOT, SURVEY. The unit of length defined by the relationship 1 foot = (1200/3937) meters, established by the U.S. Coast and Geodetic Survey in its Bulletin No. 26 (April 5, 1893). Although the meter was not defined in Bulletin No. 26, it was probably the International Prototype Meter in Paris. Practically, it was the meter derived from Meter Bars 27 (primary standard) and 21 (auxiliary standard) of the U.S. Coast and Geodetic Survey and later of the Bureau of Standards. [39]

FORE AND AFT BRIDGE. A series of connecting gangways between the forward and after bridges or between a bridge house and a forecastle deck or poop deck. It is commonly found on tankers, where such an installation is desirable on account of the slippery condition of the upper deck. Sometimes called "monkey bridge." Also called connecting bridge, flying bridge, catwalk. [36]

FORELAND. A cape or promontory. [17]

FORESHORE (ACCORDING TO COASTAL ENGINEERING). That part of the shore lying between the crest of the seaward berm (or the upper limit of wave wash at high tide) and the ordinary low-water mark. See Foreshore (according to Riparian Law). [3]

FORESHORE (ACCORDING TO RIPARIAN LAW). The strip of land between the high- and low-water marks that is alternately covered and uncovered by the flow of the tide. See Foreshore (according to Coastal Engineering). [3]

FORESHORE. In legal terminology, the strip of land between the high- and low-water marks that is alternately covered and uncovered by the flow of the tide. In coastal engineering work, it is defined as the part of the shore that lies between the crest of the berm and the ordinary low-water mark, which is ordinarily traversed by the uprush and backrush of the waves as the tide rises and falls; the foreshore would thus extend farther inshore than the shore. See Shore. [3]

FORK. One of the major bifurcations of a stream; a branch. [4]

FORMAT. The arrangement of data, e.g., the fields on a punched card or a magnetic tape assigned to particular kinds of data, a number representation with fixed number of digits before and after the decimal point, etc. (Not to be confused with format meaning "sheet dimensions.)

To rearrange data, e.g. for input to another system or output on a particular medium, such as paper, cards, etc. [22]

The predetermined arrangement of characters, fields, lines, page numbers, and punctuation marks, usually on a single sheet or in a file. This refers to input, output and files. [24]

FORM LINE. Broken lines resembling contour lines but representing no actual elevations, which have been sketched from visual observation or from inadequate or unreliable map sources, to show collectively the shape of the terrain rather than the elevation. [1]

FOUL AREA. A foul area is an area of numerous uncharted dangers to navigation. The area charted serves as a warning to the mariner that all dangers are not charted individually and that navigation through the area may be hazardous. The term "foul" should not be applied to a soft continuum with indefinite boundaries such as mud or sand; to areas congested with marine vegetation such as kelp or grass in water; or to materials not likely to cause damage to a vessel. [31]

FOUL BOTTOM. A hard, uneven, rocky or obstructed bottom having poor holding qualities for anchors, or one having rocks or wreckage that would endanger an anchored vessel. [17]

FOUL GROUND. An area unsuitable for anchoring, taking the ground, or ground fishing due to being strewn with rocks, boulders, coral or obstructions. [1]

FRACTIONAL SCALE. The scale expressed as a fraction (termed the representative fraction or "R.F." of the map) in which the numerator is unity and the denominator is the number that the unit distance must be multiplied by in order to obtain its distance on the ground in the same units, thus 1/12,000. Also used in the form 1:12,000 and 1-12,000. Sometimes referred to as natural scale. See Scale. [3]

FRACTURE ZONE. A zone of unusually irregular topography of the sea floor averaging 60 nautical miles in width and normally greater than 1000 nautical miles in length. This zone is characterized by large seamounts, steep-sided or nonsymmetrical ridges, troughs or escarpments. [4]

An extensive linear zone of unusually irregular topography of the sea floor, characterized by large seamounts, steep-sided or asymmetrical ridges, troughs, or escarpments. [17]

FRINGING REEF. A reef closely attached to a shore, as contrasted with a barrier reef which is separated from the shore by a lagoon. [17]

FUNCTION KEY (FUNCTION BUTTON). A button or switch which may be pressed to send an identifiable interrupt to a computer program, which then performs the required function. See also Menu. [22]

FUNCTION KEYBOARD. A keyboard consisting of function keys in contrast to "alphanumeric keys." [22]

G

GAP. A deep notch, ravine or opening between hills or in a ridge or mountain chain; a steep-sided depression cutting transversely across a ridge or rise. [4]

GATE. (1) (ISO) A combinational circuit with only one output channel. (2) (ISO) A device having one output channel and one or more input channels, such that the output channel state is completely determined by the input channel states, except during switching transients. (3) A combinational logic element having at least one input channel. [20]

(1) A device having one output channel and one or more input channels completely determined by the input channel states, except during switching transients. (2) A signal to trigger the passage of other signals through a circle. (3) An electrode in a field-effect transactor. [34]

GENERAL CHARTS. These U.S. National Ocean Service charts of the coast are published at scales from 1:150,001 to 1:600,000, and are intended for coastal navigation when a course is well offshore but can be fixed by landmarks, lights, buoys, and characteristic soundings. [29]

GENERALIZATION. Selection and simplified representation of Detail appropriate to the scale and/or the purpose of a map. [21]

GENERALIZATION OF DETAIL. A term used to indicate that the least essential information is not shown on a chart. The purpose of generalization is primarily to avoid over-crowding charts where space is very limited. It also serves to reduce the correctional maintenance needed and to induce navigators, at least of deeper draft vessels to use charts of larger scales. [1]

GEODESY. (1) The science concerned with determining the size and shape of the earth. This is essentially Helmert's definition of 1880. In practice, it is equivalent to determining, in some convenient coordinate system, the coordinates of points on the Earth's surface. For political and technological reasons, a large number of different coordinate systems are in use today. (2) The science that locates positions on the earth and determines the Earth's gravity field. The definition can be extended to other planetary bodies. (3) The branch of surveys in which the curvature of the Earth must be taken into account when determining directions and distances. The above three definitions are not exclusive. The term "geodesy" is commonly understood to include them all.

Geodesy can be divided into lower geodesy that concerns mainly techniques, instrumentation, and theory which does not require a knowledge of the Earth's curvature; and higher geodesy which takes the Earth's curvature into account.

Geodesy can also be divided into physical geodesy which is concerned with the gravity field, and geometric geodesy which is concerned with determining positional relationships by geometric means. Other subdivisions, such as satellite geodesy, marine geodesy, etc. refer

to special data sources, or to determinations in particular locations. [39]

GEODETIC CONTROL. A system of horizontal and/or vertical control stations that have been established and adjusted by geodetic methods and in which the shape and size of the Earth (geoid) have been considered in position computations. [10]

GEODETIC COORDINATES. The quantities of latitude, longitude, and height (ellipsoid), which define the position of a point on the surface of the earth with respect to the reference spheroid. Also imprecisely called geographic coordinates. [10]

GEODETIC DATUM (ALSO CALLED HORIZONTAL OR GEODETIC DATUM). The adopted position in latitude and longitude of a single point to which the charted features of a vast region are referred. It consists of five quantities; the latitude and longitude of the point the azimuth of a line from this point to another point to which it is tied by the triangulation, and two constants necessary to define the terrestrial spheroid. See Clarke Spheroid of 1866. [3]

GEODETIC LATITUDE. The angle which the normal at a point on the reference spheroid makes with the plane of the geodetic equator. Geodetic latitudes are reckoned from the Equator, but in the horizontal control survey of the United States they are computed from the latitude of station Meades Ranch as prescribed in the North American datum of 1927. The new North American datum of 1983 will be Earthmass centered. A geodetic latitude differs from the corresponding astronomic latitude by the amount of the meridian component of the deflection of the vertical. Also called topographical latitude. [10]

GEODETIC LONGITUDE. The angle between the plane of the geodetic meridian and the plane of an initial meridian, arbitrarily chosen. A geodetic longitude can be measured by the angle at the pole of rotation of the reference spheroid between the local and initial meridians, or by the arc of the geodetic equator intercepted by those meridians. In the United States, geodetic longitudes are numbered from the meridian of Greenwich, but are computed from the meridian of station Meades Ranch as prescribed in the North American datum of 1927. The new North American datum of 1983 will be earthmass centered. A geodetic longitude differs from the corresponding astronomic longitude by the amount of the prime vertical component of the local deflection of the vertical divided by the cosine of the latitude. Also called geocentric longitude. [10]

GEODETIC MERIDIAN. A line on a reference ellipsoid which has the same geodetic longitude at every point. Sometimes called geographic meridian. [1]

GEODETIC PARALLEL. A line on a reference ellipsoid which has the same geodetic latitude of every point. A geodetic parallel, other than the equator, is not a geodesic line. In form, it is a small circle whose plane is parallel with the plane of the geodetic equator. [1]

GEODETIC POSITION. A position of a point on the surface of the earth expressed in terms of geodetic latitude and geodetic longitude. A geodetic position implies an adopted geodetic datum. [1]

GEOGRAPHIC. Signifying basic relationship to the earth considered as a globe-shaped body. The term geographic is applied alike to data based on the geoid and on a spheroid. In geodetic surveys in this country, coordinated data consisting of latitudes, longitudes, azimuths, and lengths of lines, are recorded and published under the general title of geographic positions. [8]

GEOGRAPHIC AND OTHER NAMES. The term "geographic names" refers to localities, natural features, and man-made waterways. The name does not apply to other man-made objects or features such as roads, bridges, parks, buildings, and stadiums. [31]

GEOGRAPHICAL COORDINATES. Spherical coordinates defining a point on the surface of the earth usually latitude and longitude. Also called terrestrial coordinates. [1]

GEOGRAPHIC COORDINATES. Data defining the locations of horizontal control stations (triangulation and traverse) in terms of geographic coordinates include their latitudes and longitudes and the lengths and azimuths of the lines between contiguous stations. This system of computations takes into account the earth's curvature. [3]

GEOGRAPHIC GRATICULE. System of coordinates of latitude and longitude used to define the position of a point on the surface of the earth with respect to the reference spheroid. (Use of the word "grid" with geographic in this application is incorrect.) [25]

GEOGRAPHIC LATITUDE. A general term applying alike to astronomic and geodetic latitudes. [1]

GEOGRAPHIC LONGITUDE. A general term applying alike to astronomic and geodetic longitudes. [1]

GEOGRAPHIC MERIDIAN. A general term applying alike to astronomic and geodetic meridians. [1]

GEOGRAPHIC MILE. Same as Nautical Mile. [3]

GEOGRAPHIC NUMBER. The number assigned to an aid to navigation for identification purposes in accordance with the lateral system of numbering. [1]

GEOGRAPHIC PARALLEL. A general term applying alike to astronomic and geodetic parallels. [1]

GEOGRAPHIC POSITION. The position of a point on the surface of the earth expressed in terms of latitude and longitude, either geodetic or astronomic. [10]

GEOGRAPHIC RANGE. The greatest distance the curvature of the earth permits an object of a given height to be seen from a particular height of eye without regard to luminous intensity or visibility conditions. [37]

The maximum distance at which the curvature of the earth and terrestrial refraction permit a light to be seen from a particular height of eye without regard to the luminous intensity of

the light. The geographic range sometimes printed on charts or tabulated in light lists is the maximum distance at which the curvature of the earth and terrestrial refraction permit a light to be seen from a height of eye of 15 feet above the water when the elevation of the light is taken above the height datum of the largest scale chart of the locality. Therefore, this range is a nominal geographic range. See also visual range (of a light). [1]

GEOID. The equipotential surface in the gravity field of the earth which coincides with the undistributed mean sea level extended continuously through the continents. The direction of gravity is perpendicular to the geoid at every point. The geoid is the surface of reference for astronomic observations and for geodetic leveling. See also reference spheroid. [10]

The equipotential surface in the gravity field of the earth to which the oceans would conform over the earth if free to adjust to the combined effect of the earth`s mass attraction and the centrifugal force of the earth's rotation. As a result of the uneven distribution of the earth's mass, the geoidal surface is irregular. The geoid is a surface along which the gravity potential is everywhere equal (equipotential surface) and to which the direction of gravity is always perpendicular. Also called figure of the earth. [1]

GEYSER. A spring which throws forth intermittent jets of heated water or steam. [4]

GLACIAL GORGE. A deeply cut valley in U-shaped cross section, resulting from glacial erosion. [4]

GLACIAL LAKE. A lake, the basin of which has been carved by glacial action; also a body of water held in place by the damming action of a glacier. [4]

GLACIAL DRIFT. Sand, clay, or boulders transported by glaciers to their present locations. [4]

GLACIER. A mass of snow and ice continuously moving from higher to lower ground or, if afloat, continuously spreading. The principal forms of glaciers are ice sheets, ice shelves, ice caps, ice piedmonts, and various types of mountain glaciers. [17]

A field or body of ice, formed where snowfall exceeds melting and moving down a mountain slope or over a wide area. [4]

GLEN. A secluded and small narrow valley; a dell, dale or vale. [4]

GLOBAL POSITIONING SYSTEM (GPS). See as NAVSTAR GLOBAL POSITIONING SYSTEM. [1]

GNOMONIC CHART. A chart constructed on the gnomonic projection and often used as an adjunct for transferring a great circle to a Mercator chart. Commonly called Great-Circle Chart. [1]

GNOMONIC MAP PROJECTION. A perspective azimuthal map projection in which points on the surface of a sphere or spheroid, such as the earth, are conceived as projected by radials from the center to a tangent plane. Great circles project as straight lines. For this reason the projection is used principally for charts for great-circle sailing. The projection is neither

conformal nor equal-area. [1]

GORGE. A canyon; a rugged and deep ravine or gulch. [4]

GRADE. A slope of uniform inclination. [4]

GRADIENT. Any departure from the horizontal; a grade; a slope; a part of a road or railroad which slopes upward or downward; frequently used in connection with the slope of streams. [4]

GRADIENT TINTS. Tinted areas on a map or chart, normally in the form of bands following the contour pattern, used to indicate ranges of altitude. Gradient "bands". [28]

GRADUATION. The placing of marks on an instrument or device to represent standard values thereon. Also the marks so placed.

The division and subdivision of latitude and longitude shown on the borders of a chart. See also scale. [17]

GRAPHIC (ISO). A symbol produced by a process such as handwriting, drawing, or printing. Synonymous with graphic symbol. [20]

The use of diagrams or other graphical means to obtain operating data and answers. The use of written symbols and visual displays. [34]

GRAPHIC DISPLAY SYSTEM. A system consisting of a computer and at least one display device capable of generating graphic images, normally by means of a vector generator, and appropriate software to support the generation of graphics. Other peripherals, especially graphic input devices, may also be included. [22]

GRAPHIC INPUT DEVICE. A device on-line to a computer (peripheral) which allows conversion of graphic data (i.e., positions on a two-dimensional surface) into digital data, which are input directly under control of a program. Such devices are digitizer, digital tablet, scanner. [22]

GRAPHIC OUTPUT DEVICE. A device on-line to a computer (peripheral) which allows conversion of digital data into graphic images. Such devices are called either plotter or display, depending on the kind of graphic they produce (removable sheet or just displayed on a viewing surface). An additional hard copy unit may be used to obtain a removable copy of a displayed image. [22]

GRAPHIC SCALE (ALSO CALLED LINEAR SCALE). A line or bar on a map or chart subdivided to represent distances on the earth in various units, to wit: Nautical miles, statute miles, yards, feet, kilometers, etc. [3]

GRAPHICS FILE. A file containing digital data which are suitable for conversion into a graphic image by a computer graphic system. [22]

GRASS IN WATER. Grass in water, for mapping purposes, is a non-woody stemmed vascular plant (which may or may not be a true grass), that is attached to the bottom below the

sounding datum. This includes, in addition to many of the marsh plant types, the underwater and floating leaved plants such as eel grass, turtle grass, manatee grass, the water milfoils, and water-hyacinth. Grass in water is normally mapped only when the vegetation grows to the water surface. [31]

GRATICULE. (1) The network of lines representing parallels and meridians on a map, chart, or plotting sheet. A fictitious graticule represents fictitious parallels and fictitious meridians. See also grid. (2) A scale at the focal plane of an optical instrument to aid in the measurement of objects. [1]

GRAVING DOCK. A form of dry dock consisting of an artificial basin fitted with a gate or caisson, into which vessels can be floated and the water pumped out to expose the vessels' bottoms. The term is derived from the term used to describe the process of burning barnacles and other accretions from a ship's bottom. See also Floating Dock. [1]

GREAT CIRCLE. The line of intersection of the surface of a sphere and any plane which passes through the center of the sphere. The shortest distance between any two points on a sphere is along the arc of a great circle connecting the two points. The shortest distance on a ellipsoid of revolution is a geodetic line (a geodetic), which is not a plane curve except for the equator (a circle) and the meridians (ellipses). In cartography, the gnomonic is the only map projection on which a great circle in represented, in all instances, as a straight line. The gnomonic projection for a map of the United States computed by the U.S. Coast and Geodetic Survey is based on a sphere having the same volume as the ellipsoid of reference (Clarke spheroid of 1866). [8]

The intersection of a sphere and a plane through its center. The intersection of a sphere and a plane which does not pass through its center is called a small circle. Also called orthodrome, orthodromic curve. [1]

GREAT CIRCLE COURSE. The direction of the great circle through the point of departure and the destination, expressed as the angular distance from a reference direction, usually north, to the direction of the great circle. The angle, varies from point to point along the great circle. At the point of departure it is called initial great-circle course; at the destination it is called final great-circle course. [1]

GREAT CIRCLE ROUTE. The route which follows the shortest arc of a great circle between two points. [10]

GREAT LAKES. The term "Great Lakes" as used in the regulations in this subchapter shall include the Great Lakes and their connecting and tributary waters. [2]

GREAT LAKES NOTICE TO MARINERS. Notice to Mariners relating to the Great Lakes and tributary waters west of Montreal published weekly by the U.S. Coast Guard. The Notice contains selected items from the Local Notice to Mariners and other reported marine information and is intended primarily for use in correcting Great Lakes charts and related publications. See also Notice to Mariners. [1]

GREAT LAKES PILOT. United States Coast Pilot 6, Great Lakes: Lakes Ontario, Erie, Huron, Michigan, and Superior and St. Lawrence River, published in 1978 cancelled the 1977 edition of the publication formerly known as the Great Lakes Pilot. [1]

GREENWICH MERIDIAN. The meridian of the Royal Observatory, Greenwich, England. Adopted in 1884 by a conference of nations, called by the President of the United States, as the initial or zero of longitudes for all nations. [3]

The meridian through Greenwich, England, serving as the reference for Greenwich time, in contrast with local meridian. It is accepted almost universally as the prime meridian, or the origin of measurement of longitude. [1]

GREENWICH MEAN TIME (GMT). Also called universal time (UT). Mean solar time in which the day commences at midnight on the meridian of Greenwich. [7]

GRID. A network composed of two sets of uniformly-spaced straight lines intersecting in right angles. In surveying and mapping, the term grid is applied to a plane-rectangular coordinate system imposed upon a geographic coordinate system. See State Coordinate Systems. [8]

(1) A series of lines, usually straight and parallel, superimposed on a chart or plotting sheet to serve as a directional reference for navigation. See also graticule, definition 1. (2) Two sets of mutually perpendicular lines dividing a map or chart into squares or rectangles to permit location of any point by a system of rectangular coordinates. Also called reference grid. See also military grid, universal transverse Mercator grid. [1]

GRID AZIMUTH. Azimuth relative to grid north. [1]

GRID BEARING. Bearing relative to grid north. [1]

GRID CONVERGENCE. The angular difference in direction between grid north and true north. It is measured east or west from true north. [1]

GRID COORDINATES. Numbers and letters of a coordinate system which designate a point on a gridded map, photograph, or chart. [10]

GRID COORDINATE SYSTEM. A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection in order that geographic positions (latitudes and longitudes) may be readily transformed into plane coordinates and the computation relating to them may be made by the ordinary methods of plane surveying. [10]

GRID DECLINATION. The angular difference in direction between grid north and true north. It is measured east or west from true north. [10]

GRID GENERATION. The process of creating a graphic image of a grid, usually by program and with a plotter or display device. [22]

GRIDIRON. A gridiron or careening grid is a flat frame, usually of parallel timber baulks, erected on the foreshore so that a vessel may dry out on it for painting or repair at low water. [16]

GRID MAGNETIC ANGLE. Angular difference in direction between grid north and magnetic north. It is measured east or west from grid north. Grid magnetic angle is sometimes called grivation and/or grid variation. [13]

GRID MERIDIAN. One of the grid lines extending in a grid north-south direction. The reference grid meridian is called prime grid meridian. In polar regions the prime grid meridian is usually the 180°-0° geographic meridian. [1]

GRID NORTH. (1) An arbitrary reference direction used with grid navigation. The direction of the 180th geographical meridian from the north pole is used almost universally as grid north. (2) The northerly or zero direction indicated by the grid datum of directional reference. [1]

GRID ORIGIN. The point, usually near the center of a grid zone, where a parallel intersects a north-south grid line coincident to a meridian. See also False Origin. [10]

GRID PARALLEL. A line parallel to a grid equator, connecting all points of equal grid latitude. [1]

GRID, RECTANGULAR. A grid composed of two families of straight lines, the lines in each family being equidistant and parallel, and the lines of one family intersecting lines of the other at right angles. If the spacing is the same in the two families, the grid is sometimes called a "square grid" or a "quadrillage." The term "grid" is often used simultaneously for "rectangular grid." [29]

GRID REFERENCE. The position of a point on a map expressed in terms of grid letters and coordinates or coordinates alone. Conventionally the easting distance is given before the northing distance. [21]

GRID SYSTEM, UNIVERSAL TRANSVERSE MERCATOR (UTM). A grid system having the following specifications: (a) maps and grids are on the transverse mercator projection in zones 6° wide longitudinally. (b) The Clarke Spheroid of 1866 is used for maps of North America (for other regions, consult the publications of the Army Map Service). (c) For North America the current (1983) datum is the North American datum of 1927. (d) The longitude of the origin lies on the central meridian of each zone. (e) The latitude of the origin is 0°. (f) The unit of length is the meter (g) The false northing is 0 m for the northern hemisphere and 10,000,000 m for the southern hemisphere. (h) The false easting is 500,000 m. (i) The scale factor at the central meridian is 0.9996. (j) The zones are numbered beginning with 1 on the zone from 180°W to 174°W, and increasing eastward to 60 on the zone from 174°E to 180°E. All grid zones are identical in size and shape. (k) The limits of latitude are 80°N and 80°S. (1) The zones are bounded by meridians whose longitudes are multiples of 6° west or east of Greenwich.

On large-scale maps and in tables an overlap of approximately 40 km (25 miles) on either side of the junction is provided for the convenience of surveyors and for artillery surveying and firing. This overlap is never used, however, in giving a reference from the grid. The transverse Mercator map projection is conformal; that is, angles measured on the map or

computed from the coordinates on the grid closely approximate their true values; at any point, corrections to lengths are the same in all directions. Conformality is important for users of the numerical values of the grid, whether gunners, surveyors, or mathematicians. [29]

GRIPPER. Metal tongues on the printing cylinder which grip the material to be printed and hold it during the printing process. [21]

GRIPPER EDGE. The edge by which paper, or other printing material, is drawn into the printing machine. [21]

GROINS. A groin is a structure projecting from shore and designed to break the current and thereby check erosion and build out the shore by a deposit of new material. Groins may be classified as permeable or impermeable: impermeable groins have solid or nearly solid structure, permeable groins have openings through them of sufficient size to permit passage of appreciable quantities of littoral drift. [31]

GROSS UNDER KEEL CLEARANCE. "Gross under keel clearance" means the distance between the keel of a tanker and the ocean bottom when the tanker is moored or anchored in calm water free of wind, wave, current, or tide conditions that would induce ship motion. [2]

GROTTO. A small, picturesque cave, vault, or cavern. [4]

GROUND. To touch bottom or run aground. In a serious grounding the vessel is said to strand. To connect an electric circuit with the earth or some other conducting body, such that the earth or body serves as part of the circuit. [1]

GROUND CONTROL (REMOTE SENSING). A point or system of points on the earth's surface whose position has been established by ground survey(s), referenced to the celestial sphere, the geoid, a given ellipsoid of reference, or an assumed origin; also called field control. [23]

GROUNDING. Grounding occurs when the bottom wire catches on the bottom, such as a shoal, or hangs on a protrusion from the bottom such as a pinnacle rock, coral head, or wreck. [6]

GROUP REPETITION INTERVAL. Of a particular LORAN-C chain, the specified time interval for all stations of the chain to transmit their pulse groups. For each chain a minimum group repetition interval (GRI) is selected of sufficient duration to provide time for each station to transmit its pulse group and additional time between each pulse group so that signals from two or more stations cannot overlap in time anywhere within the coverage area. The GRI is normally stated in terms of tens of microseconds; i.e., the GRI have a duration of 79,900 microseconds is stated as 7990. In providing means for identifying a chain within a system all stations of which transmit on the same frequency (100 kHz), the GRI is the chain signature. [1]

GROUP REPETITION INTERVAL CODE. The group repetition interval in microseconds divided by 10. [1]

GUIDE. Information, usually graphic, used as a guide in scribing or allied operations. For example, an image of the compilation manuscript may be reproduced on a sheet of scribecote, which becomes a "scribing guide" for the engraver. The image itself is a "guide image" or "scribing guide image." [28]

GULCH. A small ravine; a small, shallow canyon with smoothly inclined slopes and steep sides. [4]

GULF. A tract of water within an indentation or curve of the coastline, in size between a bay and a sea - the Gulf of California, for example. [3]

A part of the sea extending into the land, usually larger than a bay. [17]

GULF STREAM. For the greater part, a warm, well-defined, swift, relatively narrow ocean current which originates where the Florida Current and the Antilles Current meet north of Grand Bahama Island. It gains its impetus from the large volume of water that flows through the Straits of Florida, an amount estimated to be more than 20 times greater per hour than all the fresh water entering the oceans from all sources such as rivers, runoff, and thawing glaciers. Near the edge of the Grand Banks of Newfoundland extensions of the Gulf Stream and the Labrador Current continue as the North Atlantic Current, which fans outward and widens in a northeastward to eastward flow across the ocean. The Florida Current, the Gulf Stream, and the North Atlantic Current together form the Gulf Stream System. Sometimes the entire system is referred to as the Gulf Stream. The Gulf Stream forms the western and northwestern part of the general clockwise oceanic circulation of the North Atlantic Ocean. [1]

GULLY. Small valley cut into soft sediments on the continental shelf or continental slope. [17]

A small channel recently cut by running water; smaller than a gulch or ravine. [4]

GUT. A narrow passage or contracted strait connecting two bodies of water. [4]

GUYOT. See Tablemount. [17]

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H

HACHURES. (1) Short lines on topographic maps or nautical charts to indicate the slope of the ground or the submarine bottom. They usually follow the direction of the slope. (2) Inward-pointing short lines or "ticks" around the circumference of a closed contour indicating a depression or a minimum. [1]

A method of portraying relief by short, wedge-shaped marks radiating from high elevations and following the direction of slope to the lowland. [23]

HALF TIDE LEVEL. The level midway between mean high water and mean low water. It may differ slightly from mean sea level. Also called mean tide level. [17]

HALFTONE. A tone pattern composed of dots of uniform density but varying in size. [28]

HALF-TONE. A technique of photography or printing in which the solid image is broken up by the use of a Screen into evenly-spaced dots of varying sizes. This given an illusion of continuous tone. [21]

HALFTONE SCREEN. A screen placed in front of the negative material in a process camera to break up a continuous-tone image into dots of black and white to produce a halftone. There are two types: ruled glass screens and contact screens. [28]

HAMMOCK. Variation of hummock, but usually characterized more by soil type and vegetation than by elevation. (Southern U.S., esp. Fla. and Gulf Coast.) [4]

HAND LEAD. A light sounding lead (7 to 14 pounds), usually having a line of not more than 25 fathoms. [1]

HARBOR. A water area nearly surrounded by land or artificial dikes forming a safe anchorage for ships. [4]

A place where ships may find shelter or refuge from the sea and the winds. According to Coast Survey terminology - for purposes of standardizing its use in surveying and charting - a natural or artificially improved body of water providing protection for vessels and generally anchorage and docking facilities. In legal terminology, it is a haven or a space of deep water so sheltered by the adjacent land as to afford a safe anchorage for ships. According to the Geneva Convention on the Territorial Sea, the outermost permanent harborworks which forms an integral part of a harbor system is regarded as forming part of the coast from which the territorial sea is measured. See Natural Harbor, Artificial Harbor. [3]

Any place which affords good anchorage and a fairly safe station for ships, or in which ships can be sheltered by the land from wind and sea. Also called haven. It is not necessary that it be landlocked or absolutely safe for ships. It is enough that it affords a reasonably safe

place of retreat from wind and storms. A place where ships are brought for commercial purposes to load and unload goods and passengers. The term "harbor" strictly speaking applies only to the area of water with the works necessary for its formation, protection, and maintenance, such as breakwaters, jetties, and so on. A port is made up of a harbor plus the freight and passenger structures such as docks, wharves, quays, and so forth, with their equipment. [36]

HARBOR CHARTS. These U.S. National Ocean Service charts are published at scales of 1:50,000 and larger, and are intended for navigating in harbors and smaller waterways and for anchorage. [29]

HARBOR LINE. The line beyond which wharves and other structures cannot be extended. [1]

Lines prescribed by the Corps of Engineers, U.S. Army, which limit the length of piers and other structures projecting into navigable channels; the construction of structures channelward of this line is not permitted unless the harbor lines are modified. Navigation improvements and surveys by the Government do not extend inside (shoreward of) the harbor lines. Harbor lines are of two types, pierhead lines and bulkhead lines. Bulkhead lines are prescribed where the waterfront construction is of a solid nature, such as marginal wharves, backfilled seawalls and bulkhead wharves; the water areas inside bulkhead lines normally may be filled in by private concerns upon proper application to the Corps of Engineers. Pierhead lines are associated with open-type construction, such as open pile piers, and no such structure may extend channelward of these lines. For waterfronts where both types of construction occur, both lines will be prescribed. Harbor lines are usually straight line-segments crossing the outermost pierheads and/or bulkhead facilities, and are marked with accurately located, permanent monuments so that local surveyors may easily locate them. [15]

HARBORMASTER. A local official who has charge of mooring and berthing of vessels, collecting harbor fees, and other duties. [15]

HARBOR OF REFUGE. A harbor provided as a temporary refuge on a stormy coast for the convenience of passing shipping. Also called port of refuge. It may or may not be part of a shipping port. [36]

HARBOUR REACH. The reach of a winding river or estuary which leads directly to the harbour. [17]

HARD COPY. (ISO) In computer graphics, a permanent copy of a display image that is portable and can be read directly by human beings, e.g., a display image that is recorded on paper. [20]

(1) Typewritten or printed characters on paper, produced at the same time information is copied or converted into machine language that is not easily read by a human. (2) A printed copy of machine output in a visually readable form, e.g., printed reports, listings, documents, summaries, etc. [34]

A copy, on paper or other flexible material, of a graphic and/or alphanumeric image as displayed by a display device. [22]

HARDWARE. (1) (ISO) Physical equipment as opposed to programs, procedures, rules, and associated documentation. (2) Contrast with software. [20]

(1) The electric, electronic, and mechanical equipment used for processing data, consisting of cabinets, racks, tubes, transistors, wires, motors, and such. (2) Any piece of automatic data-processing equipment. (Slang) [34]

Physical equipment, as opposed to the computer program or method of use, e.g., mechanical, electrical, or electronic devices. For example, a line printer is the hardware which performs the actual printing, but only when an appropriate program causes it to do so. Contrast with "software." [22]

HATCHING. The drawing or engraving of fine, parallel or crossed lines to show shading. [17]

HEAD. A precipitous cape, or promontory. See also eadland. [17]

A device that reads, writes, or erases data on a storage medium, e.g., a small electromagnet used to read, write or erase data on a magnetic drum or tape, or the set of perforating, reading, or marking devices used for punching, reading, or printing on paper tape. [9]

HEADER CARD. A card that contains information related to the data in cards that follow. [20]

A punched card which serves to identify types and characteristics of records maintained on the following cards. [34]

HEADING. The horizontal direction in which a ship actually points or heads at any instant, expressed in angular units from a reference direction, usually from 000° at the reference direction clockwise through 360°. Heading is often designated as true, magnetic, compass, or grid as the reference direction is true, magnetic, compass, or grid north, respectively. Heading should not be confused with course, which is the intended direction of movement through the water. At a specific instant the heading may or may not coincide with the course, depending upon such factors as steering errors, actions of the seas upon the ship, etc. The heading of a ship is also called Ship's Head. [1]

HEADLAND. In common usage, a land mass having a considerable elevation. In the context of the law of the sea, elevation is not an important attribute and a headland may be the apex of a salient of the coast, the point of maximum extension of a portion of the land into the water, or a point on the shore at which there is an appreciable change in direction of the general trend of the coast. [3]

HEADWATERS. The term "headwaters" means the point on a non-tidal stream above which the average annual flow is less than five cubic feet per second. The District engineer may estimate this point from available data by using the mean annual area precipitation, area drainage basin maps, and the average runoff coefficient, or by similar means. [2]

HEATH. A tract of wasteland; peat bog, usually covered by a low shrubby growth, but may have scattered small open water holes. Local in eastern Maine. [4]

HEIGHT. The vertical distance of an object, point, or level above the ground or other established reference plane. Height may be indicated as follows: very low - below 500 feet (above ground level); low-500 to 2,000 feet (above ground level); medium - 2,000 to 25,000 feet; high - 25,000 to 50,000 feet; very high above 50,000 feet. See also Altitude; Elevations. [10]

(1) The distance, in the direction of the zenith, between the top and bottom of an object; e.g., the height of a building or the height of a person. By analogy, one speaks of the height of a mountain when one thinks of the mountain as an object with a top and a bottom. However, for historical reasons connected with the use of barometers for measuring heights, one speaks of a point on the object as being at a certain altitude; e.g., "The peak is at an altitude of 3000 meters above mean sea level." (2) The distance, measured along a perpendicular, between a point and a reference surface; e.g., the height of an airplane above the ground surface. In this example, the reference surface is the surface of the Earth below the aircraft or a plane fitted to that surface. For the term geodetic height, the reference surface is an ellipsoid. (3) The distance, measured upwards along a plumb line (line at force) between a point and a reference surface of constant geopotential. Elevation is preferred if the reference surface is the geoid unless convention or definition dictates otherwise, i.e., measured elevation, orthometric elevation, etc., but normal height, etc.. The term height is also applied to elevation of the tide above or below a specified level. The term orthometric height is also in common use. Use of the term geoidal height also is proper since it is the geodetic height of a point on the geoid. [39]

HEIGHT OF TIDE. The vertical distance from the chart datum to the level of the water at any time. [17]

HEURISTIC. Pertaining to exploratory methods of problem solving in which solutions are discovered by evaluation of the progress made toward the final result. Contrast with algorithm. [9]

HI-FIX. A Decca radiolocation system designed for close-to-shore hydrographic, geophysical, constructional, and other surveys in which an accuracy of a few feet is required and which demand the use of lightweight and portable stations. The Hi-fix chain comprises three transmitting stations (master and two slaves). A common carrier frequency (1605-2000 Khz) is shared by the three stations in turn on a time-multiplex basis. The system is used in either the hyperbolic or range-range configuration. The hyperbolic mode permits multiuser operations where many receivers can work on a time-sharing basis from one set of shore stations; the range-range mode allows only one receiver to be used. Maximum operating ranges over water paths are from 160 to 320 kilometers in temperate latitudes; in tropical latitudes these ranges may be reduced by 50 percent due to atmospheric radio noise. [1]

HIGHLAND (OR HIGHLANDS). High or elevated land; a lofty headland or cliff. The mountainous or elevated part of any country; occasionally also in the names of geographical districts. [17]

HIGH SEAS. (a) Except as provided in paragraphs (b) and (c) of this section, "high seas" means all waters which are neither territorial seas nor internal waters of the United States or of any foreign country. (b) "High seas," as used in 18 U.S.C. 7(1), means the Great Lakes and waters seaward of the low water line along the coast, except waters within harbors or narrow coastal indentations enclosed by promontories. It should be noted that under 14 U.S.C. 89 the Coast Guard is authorized to enforce the laws of the United States upon the "high seas" and waters over which the United States has jurisdiction. Certain of the criminal laws of the United States are based on its special maritime and territorial jurisdiction, one of whose components is the "high seas," as defined in paragraph (b). However, this definition of "high seas" does not apply to the use of "high seas" found in 14 U.S.C. 89, to which the definition in paragraph (a) applies. A clear distinction should be maintained between the Coast Guard's authority under 14 U.S.C. 89 and the jurisdictional base of the criminal laws which apply to the special maritime and territorial jurisdiction. For example, while assault (18 U.S.C. 113) committed seaward of the territorial sea could be committed on the "high seas" for both purposes, an assault committed within the territorial sea could be committed on the "high seas" to bring it within the special maritime and territorial jurisdiction and at the same time be committed on waters over which the United States has jurisdiction (not the "high seas") for purposes of the Coast Guard's authority to undertake enforcement action. (c) "High seas," as used in section 2 of the Act of February 19, 1895, as amended, 33 U.S.C. 151, and all laws referring thereto, means the waters seaward of the lines described in Part 82 of this chapter. [2]

The open sea beyond and adjacent to the territorial sea, which is subject to the exclusive jurisdiction of no one nation. Littoral nations frequently exercise limited jurisdiction over portions of the high seas adjacent to their coasts for purposes of enforcing customs and other regulations. The Geneva Convention on the High Seas defines it as "all parts of the sea that are not included in the territorial sea or in the internal waters of a state." See Open Sea, Contiguous Zone, and Territorial Sea. [3]

HIGH TIDE LINE. The term "high tide line" is the line used in Sec. 404 determinations and means a line or mark left upon tide flats, beaches, or along shore objects that indicates the intersection of the land with the water's surface at the maximum height reached by a rising tide. The mark may be determined by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The term includes spring high tides and other high tides that occur with periodic frequency, but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. [2]

HIGH WATER. The maximum height reached by a rising tide. This may be due solely to the periodic tidal forces or it may have superimposed upon it the effects of prevailing meteorological conditions. [3]

The maximum height reached by a rising tide. The high water is due to the periodic tidal forces and the effects of meteorological, hydrologic, and/or oceanographic conditions. For

tidal datum computational purposes, the maximum height is not considered a high water unless it contains a tidal high water. [7]

HIGH WATER LINE. A generalized term associated with the tidal plane of high water but not with a specific phase of high water, such as higher high water, lower high water. See Mean High-water line, Mean high water. [3]

The line along the shore to which the waters normally reach at high water; in tidal waters, generally taken to mean the line where the plane of Mean high water intersects the land. [4]

The intersection of the land with the water surface at an elevation of high water. [7]

HIGH WATER MARK. A line or mark left upon tide flats, beach, or alongshore objects indicating the elevation of the intrusion of high water. The mark may be a line of oil or scum on alongshore objects, or a more or less continuous deposit of fine shell or debris on the foreshore or berm. This mark is physical evidence of the general height reached by wave runup at recent high waters. It should not be confused with the mean high water line or mean higher high water line. [7]

HILL. A natural elevation of the earth's surface, smaller than a mountain. See also Knoll. [17]

A small isolated elevation, not as high as a knoll. [18]

HILLOCK. A small hill. [17]

HISTORIC COAST LINE. The coast line position at date of statehood from which seaward distances may be measured to determine territorial waters of some States, Florida, and Texas for example. [26]

HOLDING GROUND. An expression usually used with a modifying adjective to indicate the quality of the holding power of the material constituting the bottom of an anchorage; e.g., of good (or poor) holding ground. [17]

The sea bottom of an anchorage designated as good or poor, depending upon whether an anchor holds, catches, or drags. Mud or silt usually is good holding ground. Rock, gravel, or hard packed sand often is poor holding ground, since an anchor often will drag, snag, or become fouled. [12]

HOLE. A small bay, as Woods Hole, Massachusetts. Local in New England. [4]

HOLIDAY. An unintentional unsurveyed area within a given hydrographic survey project where the spacing between sounding lines or surveys exceeds the maximum allowable limits. See split. [40]

HOLLOW. A small ravine; a low tract of land encompassed by hills or mountains. [4]

HOOK. Something resembling a hook in shape, particularly, (a) a spit or narrow cape of sand or gravel which turns landward at the outer end; or (b) a sharp bend or curve, as in the stream. [1]

HORIZONTAL CONTROL. A network of stations of known geographic or grid positions referred to a common horizontal datum, which control the horizontal positions of mapped features with respect to parallel and meridians, or northing and easting grid lines shown on the map. Horizontal control includes basic (marked) and supplementary (unmarked) stations. [10]

HORIZONTAL CONTROL DATUM. The position on the spheroid of reference assigned to the horizontal control (triangulation and traverse) of an area and defined by (1) the position (latitude and longitude) of one selected station in the area, and (2) the azimuth from the selected station to an adjoining station. See also Datum: Geodetic. [17]

HORIZONTAL CONTROL STATION. A station whose position has been accurately determined in x- and y-grid coordinates, or latitude and longitude. Also called horizontal control point. [10]

HORIZONTAL GEODETIC DATUM. The basis for computations of horizontal control surveys in which the curvature of the earth is considered. It consists of the astronomical and geodetic latitude and the astronomical and geodetic longitude of an initial point (origin); an azimuth of a line from this point; the parameters (radius and flattening) of the reference ellipsoid; and the geoidal separation at the origin. A change in any of these quantities affects every point on the datum. For this reason, while positions within a system are directly and accurately relatable, those points from different datums must be transformed to a common datum for consistency. The horizontal geodetic datum may extend over a continent or be limited to a small area. See also Datum. Also called horizontal datum, horizontal control datum. [1]

HOUSEKEEPING OPERATION (ISO). An operation that facilitates the execution of a computer program without making a direct contribution. For example, initialization of storage areas; the execution of a calling sequence. Synonymous with overhead operation. [20]

A general term for the operation that must be performed for a machine run usually before actual processing begins. Examples of housekeeping operations are: establishing controlling marks, setting up auxiliary storage units, reading in the first record for processing, initializing, set up verification operations, and file identification. [34]

HULK. The hull or portion of the hull of a derelict vessel, usually without superstructure or other appurtenance. A major portion of the hulk is usually visible at some stage of tide. [29]

HUMMOCK. A rounded elevation of ground, of limited size, rising out of a level surface (often swamp), frequently densely wooded. [4]

HURRICANES. Severe tropical cyclones with winds of force 12 or more on the Beaufort scale (above 63 knots). The entire Caribbean area, the Gulf of Mexico, the coastal regions bordering these bodies of water, and the North Atlantic coast are in danger of disturbances

during the hurricane season, which generally begins in June and closes with November; the months of greatest frequency and of likely severity are August, September, and October. [15]

HYDROGRAPH. A graph showing variation in stage (depth) or discharge of a stream of water over a period of time. [23]

HYDROGRAPHER. One who studies and practices the science of hydrography. [1]

HYDROGRAPHIC CHART. A nautical chart showing depths of water, nature of bottom, contours of bottom and coastline, and tides and currents in a given sea or sea and land area. Also called marine map; nautical chart. [10]

HYDROGRAPHIC SURVEY (NATIONAL OCEAN SERVICE). A record of a survey, of a given date, of a water area, with particular reference to the submarine relief which is shown by means of soundings (depth units) and depth contours. [3]

HYDROGRAPHIC SURVEY. Survey made in relation to any considerable body of water, such as a bay, harbor, lake, or river for the purposes of determination of channel depths for navigation, location of rocks, sand bars, lights, and buoys; and in the case of rivers, made for flood control, power development, navigation, water supply, and water storage. [10]

HYDROGRAPHIC SURVEY EXAMINATION. Effective October 1, 1982, consequent to a formal policy establishing Marine Center responsibility for hydrographic survey quality and final approval, the Headquarters quality control inspection of all hydrographic surveys was discontinued. It is intended that, henceforth, only a 10 percent sample of hydrographic surveys will be selected for a formal Headquarters examination. A Hydrographic Survey Examination is approximately equivalent to that accomplished in preparing the Quality Control Report. However, it differs from the quality control examination in that the effort is directed toward evaluating compliance with, and the adequacy of, standards, rather than a careful examination of the data and their quality. Each survey selected is carefully examined by N/CG242 personnel for adequacy with respect to data acquisition and conformance with applicable standards and project instructions. In addition, the overall condition of the records and the Descriptive Report are examined. The digital data representing the survey is plotted and subjected to a cursory examination (spot check) to ensure that digital data standards are being adhered to. It is noted that the examination of the survey data is limited only to that necessary to evaluate the acquisition and processing procedures. See Quality Control Report. [40]

HYDROGRAPHY. (1) The science which deals with the measurements and description of the physical features of the oceans, seas, lakes, rivers, and their adjoining coastal areas, with particular reference to their use for navigational purposes. (2) That part of topography pertaining to water and drainage features. [10]

The study of waters (including oceans, lakes, and rivers) embracing either (a) their physical characteristics, from the standpoint of the oceanographer or limnologist; or (b) the elements affecting safe navigation, from the point of view of the mariner. It is distinguished from

physical oceanography by dealing with rivers and lakes, etc., as well as with oceans and seas. It is distinguished from hydrology in that it deals only with surface waters; hydrology deals, in addition, with underground waters and usually is taken to be limited to non-marine waters. Hydrology also deals with effects of waters of the Earth on precipitation and evaporation. [39]

HYDROLANT. A radio message disseminated by the Defense Mapping Agency Hydrographic/Topographic Center and restricted to the more important marine incidents or navigational changes for which a delay in disseminating the information to mariners would adversely affect navigational safety. The HYDROLANT broadcast covers those water areas outside and eastward of NAVAREA IV in the Atlantic Ocean. Many of these warnings are temporary in nature. Others might remain in force for long periods of time and ultimately be superseded by a numbered paragraph in Notice to Mariners. HYDROLANTS constitute part of the U.S. long range radio navigational warning system. Printed copies of HYDROLANTS are published each working day in the Atlantic edition of the Daily Memorandum. The text of HYDROLANTS issued during a week and which are still in effect are printed in the weekly Notice to Mariners. The HYDROPAC broadcast covers those water areas outside and westward of NAVAREA XII in the Pacific ocean. [1]

HYPERBOLIC LATTICE. A pattern formed by two or more families of intersecting hyperbolas. [1]

HYPERBOLIC LINE OF POSITION. A line of position in the shape of a hyperbola, determined by measuring the difference in distance to two fixed points. Loran-C lines of position are an example. [1]

HYPSOGRAPHY. (1) The science or art of describing elevations of land surfaces with reference to a datum usually sea level. (2) That part of topography dealing with relief or elevation of terrain. [1]

HYPSOGRAPHIC (OR HYSOMETRIC) CURVE. A curve used to indicate the proportion of the area of the surface at various elevations above or depths below a given datum. [17]

HYPSOMETRIC TINT. A tint placed on those parts of maps where the terrain lies between specified levels; by using different shades of colour for different elevations the relief is shown. Also called layer tint, altitude tint or color gradient. [35]

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I

IALA MARITIME BUOYAGE SYSTEM. As designed by the International Association of Lighthouse Authorities, a new uniform system of maritime buoyage which is expected to be implemented by most maritime nations. However, within the single system there are two international buoyage regions, designated as Region A and Region B, where lateral marks differ only in the colors of port and starboard hand marks. In Region A, red is to port on entering; in Region B, red is to starboard on entering. The system may be briefly described as a combined cardinal and lateral system. The system applies to all fixed and floating marks, other than lighthouses, sector lights, leading lights and marks, lightships and large navigational buoys. The system provides five types of marks which may be used in combination: Lateral marks, used in conjunction with a conventional direction of buoyage, are generally used for well-defined channels. Where a channel divides, a modified lateral mark may be used to indicate the preferred route. Lateral marks may differ between buoyage regions A and B. Cardinal marks used in conjunction with the mariner's compass, indicate where the mariner may find navigable water. Isolated Danger marks indicate isolated dangers of limited size that have navigable water all around them. Safe water marks to indicate that there is navigable water around their position, e.g., mid-channel marks. Special marks, not primarily intended to assist navigation, indicate an area or feature referred to in nautical documents. [1]

ICE BUOY. A lighted or unlighted buoy of sturdy construction that replaces a buoy more easily damaged during the winter ice season. [37]

IHB. International Hydrographic Bureau. See International Hydrographic Organization (IHO). [17]

IHO. International Hydrographic Organization. An international organization the seat of which is in the Principality of Monaco. In 1970, it counted 43 Member states. See International Hydrographic Bureau (IHB). [17]

IMAGE. A visible representation. [28]

IMAGE PLANE. In general, the coated side or sensitized surface of a scribe-sheet, photographic film or plate, etc. often called the "face side" or "face." [28]

IMPROVED CHANNELS. Dredged channels under the jurisdiction of the Corps of Engineers, and maintained to provide an assigned controlling depth. Symbolized on the nautical charts by black, dashed lines to represent the side limits, with the controlling depth and date of ascertainment given together with a tabulation for more detailed information. [3]

INCH. (1) A unit of length defined to be 1/36 of a yard and equal in the U.S.A., since 1866, to exactly 1/39.37 of a meter. This equivalence was established by Act of Congress, July 28, 1866, but was put into practice only after the United States received copies of the International Prototype Meter in 1893. With changing definitions of the meter, the definition of the inch and yard change accordingly. See also meter and yard. (2) A unit of length defined (for scientific purposes) by the 1959 agreement between the U.S. Bureau of

Standards and similar organizations in other countries, to be 1/36 of the international yard (defined as exactly 0.9144 meter). This correspondence yields 1 inch = 2.54 cm. [39]

INDEX CONTOUR LINE. A contour line accentuated by a heavier line weight to distinguish it from intermediate contours. Index contours are usually shown as every fifth contour with their assigned values, to facilitate reading elevations. [10]

INGRESS. In the law of riparian rights, the right of return to his land from navigable water which a riparian owner enjoys. [3]

INHERITED ERROR. An error carried forward from a previous step in a sequential process. [9]

INITIAL POINT. A point which is established under the rectangular system of surveys and from which is initiated the cadastral survey of the principal meridian and base line that controls the cadastral survey of the public lands within a given area. [26]

INLAND RULES OF THE ROAD. Rules to be followed by all vessels while navigating upon certain inland waters of the United States. See also Colregs , Rules of the Road. [1]

INLAND SEA. A body of water nearly or completely surrounded by land, especially if very large or composed of salt water. If completely surrounded by land, it is usually called a lake. This should not be confused with closed sea, that part of the ocean enclosed by headlands, within narrow straits, etc., or within the territorial jurisdiction of a country. [1]

INLAND WATERS. Inland waters as used in 33 U.S.C. Chapter 3, means the waters shoreward of the lines described in Part 82 of this chapter, except the Great Lakes and their connecting and tributary waters as far east as Montreal, the waters of the Mississippi River between its source and the Huey P. Long Bridge and all of its tributaries emptying thereinto and their tributaries, that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway, and the Red River of the North. [2]

(U.S.) As used in marine insurance this term denotes canals, lakes, streams, rivers, watercourses, inlets, bays, and arms of the sea between projections of land. When no specific line is prescribed, the dividing line at all buoyed entrances from seaward to bays, sounds, rivers or other estuaries is a line approximately parallel with the general trend of the shore, drawn through the outermost buoy or other navigational aid of any system of buoyage. The inland waters of a state are those inside its marginal sea as well as the waters within its land territory. [36]

INLET. A narrow waterway or a gap in the land, which connects a small body of water with a larger body; a small narrow bay or creek. [4]

A narrow body of water extending into the land from a larger body of water. A long, narrow inlet with gradually decreasing depth inward is called a ria. Also called Arm, Tongue. [1]

INNER HARBOR. The part of a harbor more remote from the sea, as contrasted with the outer harbor. These expressions are usually used only in a harbor that is clearly divided into two parts, as by a narrow passageway or man-made structures. The inner harbor generally has additional protection and is often the principal berthing area. [1]

INOPERATIVE. Sound signal or radionavigation aid out of service due to a malfunction. [37]

INPUT. Pertaining to a device or process that is involved in bringing data into a computer, data processing or recording system. Also short for "input data," the data to be entered into the system. [22]

INPUT FORMAT. The particular arrangement of data to be entered into a computer system. Depends mostly on the program which is used to perform the data input. See also Format. [22]

INSET. In cartography (a) a small area outside the neat lines of a map or chart included within the neat lines or borders to avoid publishing a separate graphic of the small area alone; (b) a representation of a small area on a larger scale (e.g., town-plan inset), or of a large area at a smaller scale (e.g., orientation inset); (c) any information, not normally appearing within the geographic limits of a map, which has been enclosed by border lines and included within the map neat lines. Insets are always placed in areas where important features will not be covered. [17]

INSHORE. The zone of variable width between the shoreface and the seaward limit of the breaker zone. [1]

INSHORE TRAFFIC ZONE. A routeing measure comprising a designated area between the landward boundary of a traffic separation scheme and the adjacent coast, to be used in accordance with the provisions of Rule 10(d) of the 1972 Collision Regulations. [19]

INSTRUCTION. (1) (ISO) In a programming language, a meaningful expression that specifies one operation and identifies its operands, if any. Synonymous with imperative statement. [20]

(1) A codes program step that tells the computer what to do for a single operation in a program. (2) A set of characters, together with one or more addresses (or no address), that defines an operation and which, as a unit, causes the computer to operate accordingly on the indicated quantities. (3) A set of identifying characters designed to cause a computer to perform certain operations. A machine instruction to specific functions. [28]

INSTRUCTION CONTROL UNIT. (ISO) In a processing unit, the part that retrieves instructions in proper sequence, interprets each instruction, and applies the proper signals to the arithmetic and logic unit and other parts in accordance with this interpretation. [20]

INTERACTIVE (COMPUTER GRAPHICS) SYSTEM. A system, usually consisting of hardware and software, which is especially designed for interactive mode of operation. [22]

INTERCOASTAL. Refers to seaborne trade or navigation between domestic ports situated on noncontiguous sea coasts. [36]

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC). The 1960 Intergovernmental Conference on Oceanographic Research (ICOR), sponsored by UNESCO, included a recommendation for the establishment of the Intergovernmental Oceanographic Commission (ICO) to act as the international body responsible for coordination of all scientific investigations of the oceans by the states concerned and the international organizations. IOC was established later in 1960 by the General Conference of UNESCO and held its first session in October 1961. The assembly of IOC, which now includes members from 101 nations, meets every 2 years. [38]

INTERMEDIATE CONTOUR LINE. A contour line drawn between index contours. Depending on the contour interval, there are three or four intermediate contours between the index contours. [10]

INTERMITTENT STREAM. A stream or portion of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources. It is dry for a large part of the year, ordinarily more than 3 months. [23]

INTERNAL WATERS. (a) "Internal waters" and "inland waters" mean: (1) With respect to the United States, the waters shoreward of the territorial sea baseline. (2) With respect to any foreign country, the waters shoreward of the baseline of its territorial sea, as recognized by the United States. [2]

INTERNATIONAL BOUNDARY COMMISSION, UNITED STATES AND CANADA. The International Boundary Commission, United States and Canada, created under provisions of the treaties between the United States and Great Britain of April 21, 1906, April 11, 1908, and February 24, 1925, consists of a United States Commissioner, a Canadian Commissioner, and their assistants. The purpose of the Commission is to define, mark, and maintain the demarcation of the international boundary line between the United States and Canada. [27]

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO. The International Boundary Commission was created pursuant to the Treaty of March 1, 1889, and its jurisdiction was extended by subsequent treaties. It was reconstituted as the International boundary and Water Commission, United States and Mexico, by the Water Treaty of 1944 with expanded responsibilities, and functions under the policy direction of the Department of State and the Mexican Secretariat of Foreign Relations. The United States Section, a Federal Agency, also operates under various congressional acts. The Commission, consisting of the United States Section and the Mexican Section, is charged with implementing the provisions of existing treaties dealing with boundary and water matters affecting the two countries, to include preservation of the international boundary; distribution between the two countries of the waters of the boundary rivers; control of floods on the boundary rivers; their regulation by joint storage work to enable utilization of the waters in the two countries; improvement of quality of waters of the boundary rivers; sanitation measures; and use of waters in the boundary section of the Rio Grande to jointly develop hydroelectric power. [27]

INTERNATIONAL CARTOGRAPHIC ASSOCIATION (ICA). A member of IGU, ICA was founded in 1959 to advance the study of cartographic programs, institute research, promote training, and serve as a forum for nationals to exchange ideas and documents. In recent years it has become interested in the mapping of the ocean floors and has established a Working Group on Ocean Cartography. It has sponsored several conferences on this topic and is developing a bibliography on oceanic cartography. [38]

INTERNATIONAL CHART. One of a coordinated series of small-scale charts for planning and long range navigation. The charts are prepared and published by different Member States of the International Hydrographic Organization using the same specifications. [1]

INTERNATIONAL ELLIPSOID OF REFERENCE. A reference ellipsoid having the following approximate dimensions: semimajor axis - 6,378,388.0 metres; semiminor axis - 6,356,911.9 metres; and the flattening or ellipticity - 1/297. See also Hayford's spheroid and flattening of the earth. [17]

INTERNATIONAL GEOGRAPHICAL UNION (IGU). Founded in 1922 to promote the study of geographical problems, IGU initiates and coordinates research and provides for scientific discussion and publication. It promotes two permanent services of interest, the Bibliographic Geographique Internationale and the Bibliographie Cartographie Internationale. Commissions are appointed as needed. [38]

INTERNATIONAL GREAT LAKES DATUM (1955). IGLD (1955). Mean water level at Pointe-au-Père, Quebec, on the Gulf of St. Lawrence over the period 1941 through 1956, from which dynamic elevations throughout the Great Lakes region are measured. The term is often used to mean the entire system of dynamic elevations rather than just the referenced water level. [7]

INTERNATIONAL HYDROGRAPHIC BULLETIN. A publication, published monthly by the International Hydrographic Bureau for the International Hydrographic Organization, which contains information of current hydrographic interest. [1]

INTERNATIONAL HYDROGRAPHIC BUREAU (IHB). An organization founded in 1921 for the purpose of establishing a close and permanent association among hydrographic offices of its States Members. The Bureau's main object is to encourage coordination of hydrographic work with a view to rendering Navigation easier and safer throughout the world. A convention agreed by Member States became effective in 1970 making the IHB the executive organ of the IHO. [17]

INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO). Organized in 1970 by ratification of the Convention on the International Hydrographic Organization, IHO legally assumed the international intergovernmental responsibilities formerly held by the International Hydrographic Bureau (IHB), which now serves as the administrative or headquarters facility for IHO. IHB was founded in 1921, following a recommendation of the International Hydrographic Conference, to serve as a liaison between hydrographic services of the maritime countries. It coordinates the work of the national services, advises regional hydrographic organizations, endeavors to obtain uniformity in hydrographic documents, advances the science of hydrography, and facilitates the free exchange of hydrographic charts

and information. It serves as the World Data Center for the collection of information on oceanic soundings taken outside the continental shelf. Under the direction of the Joint IOC/IHO Guiding Committee for the General Bathymetric Chart of the World (GEBCO), it is responsible for coordinating the compilation of master plotting sheets on a scale of 1:1,000,000 that are prepared by member countries on an assigned area basis; these form the basis of GEBCO, which is published in 18 sheets on a scale of 1:10,000,000. The International Hydrographic Convention (IHC) held every 5 years, serves as the convention for representative of the various hydrographic services. Policy matters to be administered by IHB are established by the Convention. [38]

INTERNATIONAL HYDROGRAPHIC REVIEW. A publication, published twice yearly by the International Hydrographic Bureau for the International Hydrographic Organization, which contains professional articles on hydrography and related subjects. [1]

INTERNATIONAL JOINT COMMISSION, UNITED STATES AND CANADA. The International Joint Commission was organized in 1911 pursuant to the Treaty of January 11, 1909, between the United States and Great Britain. The purpose of the Commission is to prevent disputes regarding the use of boundary waters, seattle questions between the United States and Canada involving rights, obligations, or interests of either along the common frontier, and to make provisions for the adjustment and settlement of all such questions which may arise. The Regional Office monitors, evaluates, and encourages compliance with the Great Lakes Water Quality Agreement of November 22, 1978. [27]

INTERNATIONAL MARITIME ORGANIZATION: IMO. (formerly Inter-governmental Maritime Consultative Organization: IMCO) Established in 1959, (as the UN-sponsored international agency for the promotion of maritime safety and marine pollution prevention) IMO is mainly concerned with maritime safety and coordinates work relating to atomic propulsion, aviation, health, labor, meteorology, oceanography, and telecommunications. Since the Torrey Canyon sinking in 1967, it has been especially concerned with oil pollution of the seas and collects and disseminates technical information on oil pollution, sets standards for the shipment of oil and the prevention of oil spills, and sponsors conventions on these matters. It has also been asked to be concerned with the prevention of pollution caused by all discharges from sea-going vessels. Its Marine Environment Protection Committee (MEPC) has cognizance over matters pertaining to oil spills and other aspects of marine pollution. In 1976 the International Conference on the Establishment of an International Maritime Satellite System (INMARISAT) concluded an agreement to establish under the auspices of IMCO an International Maritime Satellite Organization (INMARSAT) that will administer a worldwide system for maritime communications. IMO is also concerned with and has developed programs concerned with Safety of Life at Sea (SOLAS). Together with IHO it is developing a Worldwide Radio Navigation Warning System (WRNWS) for the rapid dissemination of navigational data on an organized international cooperative basis. [38]

The Specialized Agency of the United Nations responsible for maritime safety and efficiency of navigation. IMO is recognized as the only international body responsible for establishing and recommending measures on an international level concerning ships' routing. Through its appropriate bodies, IMO keeps the subject of ships' routing under continuous review. IMCO became the International Maritime Organization (IMO) on May 22, 1982. [1]

INTERNATIONAL NAUTICAL CHARTS. The five National Ocean Service charts cover the north eastern Pacific Ocean and the Bering Sea at scales of 1:3,500,000 or 1:10,000,000 and are compiled to international standardized cartographic specifications. The navigational information includes depth curves, soundings, nautical symbols, and related data. Fifteen nations participated in the production of this series of small-scale charts to cover the entire world. [29]

INTERNATIONAL NAUTICAL MILE. A unit of length equal to 1,852 metres. This value was approved by the International Hydrographic Conference of 1929 and has been adopted by nearly all maritime states. [17]

Equals 6,076.10333 feet or 1,852.0 meters. Adopted by the United States July 1, 1954. See Nautical Mile. [3]

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO). Founded in 1946, ISO promotes the development of standards in the world with a view to facilitate international exchange of goods and services and to develop mutual cooperation in the sphere of intellectual, scientific, technological, and economic activity. [38]

INTERNATIONAL RULES. The rules of the road established by agreement between maritime nations, governing the navigation of the high seas. [36]

INTERNATIONAL RULES OF THE ROAD. The rules of navigation that are applicable to the water areas seaward of the lines established by the U.S. Coast Guard. [3]

INTERPRET. (1) To print on a punch card the information punched in that card, (2) to translate non-machine language into machine language instructions. [24]

INTERRUPTED QUICK FLASHING LIGHT. A quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration. [37]

INTERSECTION STATION. An object whose horizontal position is determined by observations from other survey stations, no observations being made at the object itself. Intersection stations are either objects which would be difficult to occupy with an instrument, or survey signals whose positions can be determined with sufficient accuracy without being occupied. Also called intersected point. [10]

INTRACOASTAL WATERWAY. An inside protected route extending through New Jersey; from Norfolk, Virginia, to Key West, Florida; across Florida, from St. Lucie Inlet to Fort Myers, Charlotte Harbor, Tampa Bay, and Tarpon Springs; and from Carabelle, Florida, to Brownsville, Texas. [1]

ISLAND (ACCORDING TO COAST SURVEY USAGE). A land area (smaller than a continent) extending above and completely surrounded by water at mean high water; an area of dry land entirely surrounded by water or a swamp; an area of swamp entirely surrounded by open water. See Island (According to Geneva Convention). [3]

ISLAND (ACCORDING TO GENEVA CONVENTION). A naturally formed area of land, surrounded by water, which is above water at high tide. See Island (according to Coast Survey usage). [3]

ISLAND. A body of land extending above and completely surrounded by water at the Mean High Water stage; an area of dry land entirely surrounded by water or swamp; an area of swamp entirely surrounded by open water. [4]

ISLAND SHELF. A zone adjacent to an island and extending from the low-water line to a depth at which there is a marked increase of slope to greater depth. [4]

ISLAND SLOPE. A declivity from the outer edge of an island shelf into greater depths. [4]

ISLET. A small island. [4]

ISOBATH. See Depth Contour. [1]

ISOGONIC. A line connecting points of equal magnetic variation. Also called Isogonic Line, Isogonal. [1]

ISOGONIC CHART. A chart showing magnetic variation with isogonic lines and the annual rate of change in variation with isoporic lines. [1]

ISTHMUS. A narrow strip of land connecting two larger bodies of land. [4]

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J

JETTY. A structure built out into the water to restrain or direct currents, usually to protect a river mouth or harbor entrance from silting. [4]

(U.S. usage) On open seacoasts, a structure extending into a body of water, and designed to prevent shoaling of a channel by littoral materials, and to direct and confine the stream or tidal flow. Jetties are built at the mouth of a river or tidal inlet to help deepen and stabilize a channel. [14]

An engineering structure projecting into the water, of the nature of a pier, dike, embankment, constructed of timber, earth, stone or a combination thereof. By means of jetties at the mouth of a river and at the entrance to a tidal harbor, the channel may be narrowed and the current concentrated so as to increase the depth of water over the entrance bar. [36]

JULIAN DATE. Technique for the identification of successive days of the year when monthly notation is not desired. This is especially applicable in computer data processing and acquisition where library indexing is necessary. [7]

JULIAN DAY. The number of each day, as reckoned consecutively since the beginning of the present Julian period on January 1, 4713 BC. It is used primarily by astronomers to avoid confusion due to the use of different calendars at different times and places. The Julian day begins at noon, 12 hours later than the corresponding civil day. The day beginning at noon January 1, 1968, was Julian day 2,439,857. [1]

JUNCTION. A place of joining of two channels, as that of tributary with a main river. [37]

In levelling, the place where two or more lines of levels are connected together.
In hydrographic survey, the joining of two adjacent survey sheets. [17]

JUNCTION BUOY. A buoy which, when viewed from a vessel approaching from the open sea or in the same direction as the main stream of flood current, or in the direction established by appropriate authority, indicates the place at which two channels meet. See also Bifurcation Buoy. [1]

JUSTIFY. (1) (ISO) To control the printing positions of characters on a page so that both the left-hand and right-hand margins of the printing are regular. (2) (ISO) To shift the contents of a register, if necessary, so that the character at a specified end of the data that has been read or loaded into the register is at a specified position in the register. (3) To align characters horizontally or vertically to fit the positioning constraints of a required format. (4) See left-justify, right-justify. [20]

(1) To adjust exactly, as by spacing; to align a set of characters horizontally (or vertically) to right or left margins. To develop exact format or spacing in words, fields, items, or data as designed by context of exact specifications. (2) To move a data item so that a particular part of the item assumes a particular position relative to some reference point in a storage medium; for instance, to adjust the print on a printed page so that the left, right, or both margins are aligned; also to shift the item in most or least significant digit. [34]

K

KAPP. A unique, internal AIS number assigned by the data base administrator which corresponds to each chart panel, inset or extension of all NOS nautical charts. [29]

KELP. This type is restricted to kelp (which is botanically a brown algae). Kelp is so frequently associated with rocky bottoms, and therefore possible dangers to navigation, that it should not be confused with, or compiled as, other marine vegetation. Kelp of one species or another is widely found in the cold oceans of the world. [31]

One of an order (Laminariales) of usually large, blade-shaped, or vinelike brown algae (principally American usage). Representative species are the giant kelp (Macrocystis pyrifera), bull kelp (Nereocystis luetkeana or Durvillea antarctica), elk kelp (Pelagophycus porra), and laminarians (species of Laminaria). [12]

KEY. A low island or reef; a cay. [4]

(ISO) One or more characters, within a set of data, that contains information about the set. [20]

(1) A group of characters usually forming a field, utilized in the identification of location of an item. (2) A marked lever manually operated for copying a character, e.g., typewriter paper-tape perforator, card punch manual keyboard, digitizer or manual word generator. (3) That part of a word, record, file, etc., by which it is identified or controlled. (4) The field by which a file of records is sorted into order, e.g., the key for a file of employee records by a number, department, or letter. [34]

KEYBOARD. A device for the encoding of data by key depression, which causes the generation of the selected code element. Used for manual data entry (input) into a data processing or recording system. See also Function Keyboard. [22]

KEYPUNCH (ISO). A keyboard-actuated punch that punches holes in a data medium. Synonymous with keyboard punch. [20]

(1) A special device to record information in cards or tape by punching holes in the cards or tape to represent letters, digits, and special characters. (2) To operate a device for punching holes in cards or tape. [34]

KILL. A channel, creek, stream, as the kills between Staten Island and Bergen Neck. [4]

KNOB. A rounded hill or mountain, especially an isolated one. [4]

KNOLL. A small round hill; a mound; a seamount rising less than 500 fathoms from the sea floor and having a pointed or rounded top. [4]

KNOT. A unit of speed defined (1978) as 1 international nautical mile per hour. It was previously defined as 1 nautical mile per hour, but this led to confusion because the American and

British nautical miles differ by 1.184 m. The knot is equal to 1.852 km/h. [39]

A division of the log line, by which the ship's speed is measured.
A nautical unit of speed. One knot is one nautical mile per hour. The name is derived from the knots in the log line. [17]

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L

LABEL. (1) (ISO) One or more characters, within or attached to a set of data, that contain information about the set, including its identification. (2) (ISO) In computer programming, an identifier of an instruction. [20]

(1) A set of symbols used to identify or describe an item, record, message, or file. Occasionally it may be the same as the address in storage. (2) To assign a symbol, acronym, or word, as a means of identification, to a body of data, tape, card deck, block, etc.; to create a specialized associated record or filing "handle." [34]

LAGOON. An enclosed area of salt or brackish water separated from the open sea by some more or less effective, but not complete, obstacle such as low sand bank. The name most commonly used for the area of water enclosed by a barrier reef or atoll. [17]

(1) A shallow sound, pond, or lake generally separate from the open sea. (2) A body of water enclosed by the reefs and islands of an atoll. [1]

LAKE. The term "lake" means a standing body of open water that occurs in a natural depression fed by one or more streams from which a stream may flow, that occurs due to the widening or natural blockage or cutoff of a river or stream, or that occurs in an isolated natural depression that is not a part of a surface river or stream. The term also includes a standing body of open water created by artificially blocking or restricting the flow of a river, stream, or tidal area. As used in this regulation, the term does not include artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water for such purposes as stock watering, irrigation, settling basins, cooling, or rice growing. [2]

(1) Any standing body of inland water, generally of considerable size. There are exceptions such as the lakes in Louisiana which are open to or connect with the Gulf of Mexico. Occasionally a lake is called a sea, especially if very large and composed of salt water. [1]

LAMBERT CONFORMAL CONIC PROJECTION. A conformal map projection of the conical type, on which the meridians are straight lines meeting in a common point outside the limits of the map, and the parallels are concentric arcs of circles having the common point as center. The projection with two standard parallels is the base for the State Coordinate Systems for states whose greatest extent is in an east-west direction. See State Coordinate Systems. [3]

LANDFALL. The first sighting of land when approached from seaward. By extension, the term is sometimes used to refer to the first contact with land by any means, as by radar. [1]

LANDING. A place where boats receive or discharge passengers, freight, etc. See Wharf. [1]

LANDLOCKED. Indentations along the open coast that are nearly cut off from access to the sea; almost completely surrounded by land - for example, San Francisco and San Diego Bays. [3]

LANDMARK. An object of enough interest or prominence in relation to its surroundings to make it outstanding or to make it useful in determining a location or a direction. [10]

Monument or material mark or fixed object used to designate a land boundary on the ground; any prominent object on land that may be used to determine a location or a direction in navigation or surveying. [25]

In marine terminology a landmark is an object or feature of known position that is conspicuous to the mariner and so located that it can be used for navigation.
A landmark should be readily identifiable by the mariner and located where it will be visible through a useful range of travel. An object that is conspicuous at one point, but quickly becomes lost in background clutter or hidden from view by obstructions as the mariner progresses is of limited value. Landmarks are classified according to one of the following types.

Type I - These are the landmarks with Third-Order, Class I or better positions and recorded on the 76-40 form. These are typically tanks, church spires, cupolas, radio towers, etc., which can be of value not only in navigation, but as control for further positioning by the field edit or hydro parties, U.S. Coast Guard, or other interested parties.

Type II - These are the landmarks with less than Third-Order accuracy, but still recorded on the 76-40 form. They are similar in nature to Type I landmarks, but may be positioned by photogrammetric or field methods yielding less than Third-Order accuracy.

Type III - These are the objects and features compiled because of their landmark value, but not carried on the 76-40. Specific points on these items are not positioned, but the entire feature is compiled as any other planimetry. Building in harbor areas, powerlines, cliffs and bluffs, and stadiums are examples of Type III landmarks. [31]

LAND MILE. See Statute Mile. [1]

LANDSLIDE. Earth and rock which becomes loosened from a hillside by moisture or snow, and slides or falls down the slope. [4]

LANE. An established route as an air lane or shipping lane. In an electronic radiolocation lattice, the zone between two lines on which measured values, expressed in terms of the system's electronic unit (wave length or microsecond), are whole numbers and are one unit apart. [17]

LANGUAGE. (1) (ISO) A set of characters, conventions, and rules, that is used for conveying information. [20]

A defined set of characters that is used to form symbols, words, etc., and the rules for combining these into meaningful communications, e.g., English, French, ALGOL, FORTRAN, COBOL, etc. [34]

LAPLACE AZIMUTH. A geodetic azimuth derived from an astronomic azimuth by use of the Laplace equation. [10]

LARGE NAVIGATIONAL BUOY (LNB). A large buoy designed to take the place of a lightship where construction of an offshore light station is not feasible. These 40-foot diameter buoys may show secondary lights from heights of about 36 feet above the water. In addition to the light, these buoys may mount a radiobeacon and provide sound signals. A station buoy may be moored nearby. Called lighthouse buoy in British terminology. [1]

A 40 foot diameter, automated discuss shaped buoy used to replace light vessels. [37]

LARGE-SCALE (SURVEY OR CHART). A relative term, but generally one covering a small area on the ground. In Coast Survey usage, a scale of 1:80,000 (1 inch on survey or chart = 80,000 inches on the ground) would be the upper limit of such classification. See Small-Scale. [3]

LARGE-SCALE CHART. For purposes of distinguishing and generalizing topographic line data and other selected data within the AIS data base, any NOS nautical chart of a scale 1:105,000 and larger. [29]

A relative term, but generally one covering a small area on the ground. In Coast Survey usage, a scale of 1:80,000 (1 inch on chart = 80,000 inches on the ground) would be the upper limit of such classification. See Small-Scale Chart. [3]

LATERAL BOUNDARIES. Side boundaries; boundaries between adjacent states extending from shore to their seaward boundaries under Public Law 31; boundaries between adjacent nations through the marginal sea and the contiguous zones. [3]

LATERAL SYSTEM. A system of aids to navigation in which buoys, daybeacons and minor lights are assigned colors and shapes in accordance with their respective location in relation to safe water. [37]

A system of aids to navigation in which the shape, color, and number distinction are assigned in accordance with their location in respect to navigable waters. When used to mark a channel, they are assigned colors to indicate the side they mark and numbers to indicate their sequence along the channel. The lateral system is used in the United States. In the Cardinal System the aids are assigned shape, color, and number distinction in accordance with location relative to the nearest obstruction. [1]

LATITUDE. Angular distance from a primary great circle or plane. Terrestrial latitude is angular distance from the equator, measured northward or southward through 90° and labeled N or S to indicate the direction of measurement; astronomical latitude at a station is angular distance between the plumb line and the plane of the celestial equator; geodetic or topographical latitude at a station is angular distance between the plane of the geodetic equator and a normal to the ellipsoid; geocentric latitude is the angle at the center of the reference ellipsoid between the celestial equator and a radius vector to a point on the ellipsoid. Geodetic and sometimes astronomical latitude are also called geographic latitude. Geodetic latitude is used for charts. Assumed (or chosen) latitude is the latitude at which an observer is assumed to be located for an observation or computation. Observed latitude is determined by one or more lines of position extending in a generally east-west direction. Grid latitude is angular distance from a grid equator. Middle or mid latitude is the latitude at which the arc length of the parallel separating the meridians passing through two specific

points is exactly equal to the departure in proceeding from one point to the other by middle-latitude sailing. Mean latitude is half the arithmetical sum of the latitude of two places on the same side of the equator. The mean latitude is usually used in middle-latitude sailing for want of a practical means of determining middle latitude. Difference of latitude is the shorter arc of any meridian between the parallels of two places, expressed in angular measure. Magnetic latitude, magnetic inclination, or magnetic dip is angular distance between the horizontal and the direction of a line of force of the earth's magnetic field at any point. A parallel of latitude is a circle (or approximation of a circle) of the earth, parallel to the equator, an connecting points of equal latitude; or a circle of the celestial sphere, parallel to the ecliptic. Horse latitudes are the regions of calms and variable winds coinciding with the sub-tropical high pressure belts on the poleward sides of the trade winds, especially the northern of these two regions in the North Atlantic. [1]

LATITUDE SCALE. The subdivided east and west borders of a Mercator chart into degrees and minutes; a variant of the graphic scale, since a minute of latitude is very nearly equal to a nautical mile. See Graphic Scale. [3]

LATTICE. A pattern formed by two or more families of intersecting lines, such as that pattern formed by two or more families of hyperbolas representing, for example, curves of equal time difference associated with a hyperbolic radionavigation system. Sometimes the term pattern is used to indicate curves of equal time difference, with the term lattice being used to indicate its representation on the chart. [1]

LAVA. The fluid or semi-fluid matter flowing from a Volcano. The substance that results from the cooling of the molten rock. Part of the ocean bed is composed of lava. [17]

LEAD. A weight attached to a line. A sounding lead is used for determining depth of water. A hand lead is a light sounding lead (7 to 14 pounds), usually having a line of not more than 25 fathoms. A deep sea lead is a heavy sounding lead (about 30 to 100 pounds), usually having a line 100 fathoms or more in length. A light deep sea lead (30 to 50 pounds), used for sounding depths of 20 to 60 fathoms is called a coasting lead. A type of sounding lead used without removal from the water between soundings is called a fish lead. A drift lead is one placed on the bottom to indicate movement of a vessel. To heave the lead is to take a sounding with a lead. [1]

LEAD LINE. A line, graduated with attached marks and fastened to a sounding lead, used for determining the depth of water when making soundings by hand. The lead line is usually used in depths of less than 25 fathoms. Also called sounding line. [1]

LEADING LIGHT. A light so located that vessels may steer directly for it until close aboard, when a new course is taken. [37]

LEADING. The forward or top edge of a sheet, plate, blanket, etc., as the gripper edge. [30]

LEAGUE. A measure of distance, varying for different time and for different countries from 2.4 to 4.6 miles. See Marine League. [3]

LEDGE. A rocky formation connected with and fringing the shore, and generally uncovered at the sounding datum. [3]

A rocky formation continuous with and fringing the shore. The area that uncovers is usually represented on charts by symbols. [4]

LEFT BANK. That bank of a stream or river on the left of an observer facing in the direction of flow, or downstream. See also Right Bank. [1]

LEFT-JUSTIFY. (1) (ISO) To shift the contents of a register, if necessary, so that the character at the left-hand end of the data that has been read or loaded into the register is at a specified position in the register. (2) (ISO) To control the printing positions of characters on a page so that the left-hand margin of the printing is regular. [20]

Data is left justified when the left-hand digit or character (or its sign) occupies the left-hand position of the space allotted for that data. [34]

LEG. Each straight section of a traverse. One part of a craft's track consisting of a single course line. [17]

LEGEND. A description, explanation, table of symbols, and other information, printed on a map or chart to provide a better understanding and interpretation of it. The title of a map or chart formerly was considered part of the legend, but this usage is obsolete. [17]

LEVEE. An artificial bank confining a stream channel or limiting areas subject to flooding; an embankment bordering on one or both sides of a submarine canyon or seachannel, usually occurring along the outer edge of a curve or meander. [4]

(1) An artificial bank confining a stream channel or limiting adjacent areas subject to flooding. (2) On the sea floor, an embankment bordering a canyon, valley, or seachannel. [1]

LEVELING. (1) The process of finding vertical distances (elevations) from a selected equipotential surface to points on the Earth's surface, or of finding differences of elevation. Usually, leveling must be done either as the sum of incremental vertical displacements of a graduated rod (differential leveling) or by measuring vertical angles (trigonometric leveling). Unless some other method is specified, differential leveling is usually meant. The term is sometimes used to refer to barometric altimetry and topographic photogrammetry. It is also used in referring to the astronomic determination of the geoid (see geoid determination, astrogeodetic method of), and may be known as astrogeodetic leveling or astronomic leveling. The reference surface required by the definition is, ideally, the geoid but, because the geoid is not accessible by any method of surveying, the surface actually used is one assumed to be close to the geoid, even though it may not be exactly an equipotential surface. Leveling between two points relatively close from each other (within 2-3 meters vertically, and less than 100 meters horizontally) is done by holding a graduated leveling rod vertically at each point and reading, with a horizontal telescope placed midway between the two points, the place where each rod intersects the horizontal plane established by the telescope's line of sight. The difference in readings is, approximately, the difference in elevation. If the points are farther apart than the distances mentioned above, measurements are made at shorter distance intervals and the total difference in elevation is taken as the sum of the resulting smaller measured differences. The elevation of a point is determined by proceeding as above, starting at a point that is either on the reference surface or at a previously

determined elevation. The desired elevation is called the orthometric elevation; quantities approximating the orthometric elevation and derived from the measurements by applying various kinds of corrections are given special names such as Helmert height, Neithammer elevation, and the like. (2) The process of finding the elevation of mean sea level above the geoid without reference to measurements on land. This is more properly called oceanographic leveling. (3) A leveling network. [39]

LEVELLING, WATER. A method of obtaining relative elevations by observing heights with respect to the surface of a body of still water, such as a lake. The relative elevations of objects along its shores are obtained by taking the differences of their heights with respect to the surface of the water. [17]

LIGHT. The signal emitted by a lighted aid to navigation; a piece of illuminating apparatus; a lighted aid to navigation on a fixed structured. [37]

LIGHT FLOAT. A buoy having a boat-shaped body smaller than a lightship. Light-floats are usually unmanned and are used instead of smaller lighted buoys in waters where strong currents are experienced. [1]

LIGHTHOUSE. A building on some conspicuous point of the coast, a pier or jetty, an island or rock, from which a light is exhibited at night as an aid to navigation. All maritime nations have government departments responsible for the establishment and maintenance of lighthouses. [36]

LIGHT LIST. (1) A publication giving detailed information regarding lighted navigational aids and fog signals. The name and location of the lighted aids, their characteristics, heights, range, structure description, and other pertinent remarks are given. (2) Light list, published by the U.S. Coast Guard in five volumes, covers the waters of the United States and its possessions including the Intracoastal Waterway, the Great Lakes (both United States and certain aids on the Canadian shores), and the Mississippi River and its navigable tributaries. In addition to the information on lighted aids, the Light List gives information on unlighted buoys, radiobeacons, radio direction finder calibration stations, daybeacons, racons, etc. (3) List of Lights, published by the Defense Mapping Agency Hydrographic/Topographic Center in seven volumes, covers waters other than the United States and its possessions. In addition to the information on lighted aids, the List of Lights provides information on storm signals, signal stations, radio direction finder stations, radiobeacons, etc. [1]

LIGHT LIST NUMBER. The number used to identify a navigational light in the light list. This number should not be confused with International Number, which is an identifying number assigned by the International Hydrographic Organization. The international number is in italic type and is located under the light list number in the light list. Sometimes called list of lights number. [1]

LIGHT SECTOR. As defined by bearings from seaward, the sector in which a navigational light is visible or in which it has a distinctive color different from that of adjoining sectors, or in which it is obscured. [1]

The arc over which a light is visible described in degrees true as observed from a vessel

toward the light. [37]

LIGHTSHIP. A distinctively marked vessel providing aids to navigation services similar to a light station, i.e., a light of high intensity and reliability, sound signal, and radiobeacon, and moored at a station where erection of a fixed structure is not feasible. It should be borne in mind that most lightships are anchored to a very long scope of chain and, as a result, the radius of their swinging circle is considerable. The chart symbol represents the approximate location of the anchor. Also called light vessel. [1]

LIGHT STATION. A manned station providing a light usually of high intensity and reliability. It may also provide sound signal and radiobeacon services. In many instances, sound signals, radiobeacon equipment, and operating personnel are housed in separate buildings near the light structure. [1]

LINE. In graphic arts usage, this term refers to any negative, print, copy, or printing plate which is composed of solid image areas without halftone patterns. [28]

LINEAR SCALE (USA: BAR SCALE). A sub-divided line which shows distances at a given scale. [21]

LINE DRAWING. Map copy suitable for reproduction without the use of a screen; a drawing composed of lines as distinguished from continuous-tone copy. [25]

LINE FEATURE. A cartographic feature with the geometry of a line, i.e., defined by a sequence of connected points. Represented on a map by a line of certain width or type, e.g., dashed, dotted, double, a sequence of symbols. Contrast with "point feature" and "area feature." [22]

LINE FOLLOWING (DIGITIZING). Manual, semi-automatic, or automatic following of lines represented in a two-dimensional copy by means of the measuring device of the digitizer with simultaneous automatic measurement of absolute or incremental rectangular coordinates of points on the line in predefined time and/or distance intervals. [22]

LINE, GREAT-CIRCLE. In land surveying, the line of intersection of the surface of the earth and the plane of a great circle on the celestial sphere. [39]

LINE MODE. (1) Mode of operation of a light spot projector (photo head, optical exposure head) during which light is projected onto photosensitive drawing material during movement of the projector along a line. Contrast with "flash mode." Also the production of lines using ink, lead, or scribing tools. (2) Short for line following mode in digitizing. [22]

LINE OF SOUNDINGS. A series of soundings obtained by a vessel underway, usually at regular intervals. In piloting, this information may be used to determine an estimated position, by recording the soundings at appropriate intervals (to the scale of the chart) along a line drawn on transparent paper or plastic, to represent the track, and then fitting the plot to the chart, by trial and error. A vessel obtaining soundings along a course line, for use in making or improving a chart, is said to run a line of soundings. [1]

LINE PLOTTER. Any plotter that generates an image line segment by line segment. Contrast with "raster plotter." [22]

LINE SEGMENT. Any part of a line feature between two specified points, the start and end point of the segment. May be stored in digital form as one record containing a sequence of pairs of coordinates. [22]

LINE SMOOTHING. The numerical manipulation of data points (pairs of coordinates) in order to reduce the number or amount of undulations along a line. May be used to remove irregularities introduced during digitizing, e.g., in case of line segments which do not join exactly or smoothly enough. [22]

LITHOGRAPHY. A planographic method of printing based on the chemical repulsion between grease and water to separate the printing from non-printing areas. See also Offset Lithography; Photolithography. [10]

LITTORAL. Pertaining to the shore, especially of the sea; a coastal region. Used co-extensively with "riparian." See Riparian Lands. [3]

LITTORAL CURRENT. A current in the littoral zone such as a longshore or rip current. [7]

LITTORAL STATE. One that borders on the sea or great lakes. Corresponds to Riparian State, which borders on a river. See Riparian Lands. [3]

LITTORAL ZONE. In coastal engineering, the area from the shoreline to just beyond the breaker zone. In biological oceanography, it is that part of the benthic division extending from the high water line out to a depth of about 200 meters. The littoral system is divided into a eulittoral and sublittoral zone, separated at a depth of about 50 meters. Also, frequently used interchangeably with intertidal zone. [7]

LOAD (ISO). In computer programming, to enter data into storage or working registers. [20]

To enter or add to the internal storage of a computer various information from auxiliary, intermediate, or external storage. [34]

(1) to put data into a register or storage; (2) to put a magnetic tape onto a tape drive, or to put cards into a card reader. [24]

In programming: to enter data into storage or working registers. The data may be program subroutines or whole programs. [22]

LOCAL COORDINATE SYSTEM. A right-handed rectangular coordinate system of which the z-axis coincides with the plumb line through the origin. [10]

LOCAL DATUM. The point of reference of the geodetic control used exclusively in a small area. Usually identified by a proper name. [10]

LOCAL MAGNETIC ANOMALY. Abnormal or irregular variation of the Earth's magnetic field extending over a relatively small area, due to local magnetic influences. Also called anomalous magnetic variation; local attraction; local magnetic disturbance; magnetic anomaly. [10]

LOCAL MAGNETIC DISTURBANCE. An anomaly of the magnetic field of the earth, extending over a relatively small area, due to local magnetic influences. Also called local attraction, magnetic anomaly. [1]

LOCK. A basin in a waterway with caissons or gates at each end by means of which vessels are passed from one water level to another without materially affecting the higher level. To lock a vessel means to pass a vessel through a lock. [1]

LOCAL NOTICE TO MARINERS. A written document providing information pertaining to the condition of aids to navigation and the waterways within each Coast Guard District that is of interest to the mariner. [37]

A notice issued by each U.S. Coast Guard District to disseminate important information affecting navigational safety within the District. The Notice reports changes to and deficiencies in aids to navigation maintained by and under the authority of the U.S. Coast Guard. Other information includes channel depths, new charts, naval operations, regattas, etc. Since temporary information, known or expected to be of short duration, is not included in the weekly Notice to Mariners published by the Defense Mapping Agency Hydrographic/Topographic Center, the appropriate Local Notice to Mariners may be the only source of such information. Much of the information contained in the Local Notice to Mariners is included in the weekly Notice to Mariners. The Local Notice to Mariners is published as often as required; usually weekly. It may be obtained, free of charge, by making application to the appropriate Coast Guard District Commander. See also Great Lakes Notice to Mariners. [1]

LOG BOOMS. Heavy logs chained or lashed together and moored or anchored so as to enclose and contain rafted logs. [15]

LONGITUDE. Angular distance, along a primary great circle, from the adopted reference point; the angle between a reference plane through the polar axis and a second plane through that axis. Terrestrial longitude is the arc of a parallel, or the angle at the pole, between the prime meridian and the meridian of a point on the earth, measured eastward or westward from the prime meridian through 180°, and labeled E or W to indicate the direction of measurement. Astronomical longitude is the angle between the plane of the prime meridian and the plane of the celestial meridian; geodetic longitude is the angle between the plane of the geodetic meridian at a station and the plane of the geodetic meridian at Greenwich. Geodetic and sometimes astronomical longitude are also called geographic longitude. Geodetic longitude is used in charting. Assumed longitude is the longitude at which an observer is assumed to be located for an observation or computation. Observed longitude is determined by one or more lines of position extending in a generally north-south direction. Difference of longitude is the smaller angle at the pole or the shorter arc of a parallel between the meridians of two places, expressed in angular measure. Fictitious longitude is the arc of the fictitious equator

between the prime fictitious meridian and any given fictitious meridian. Grid longitude is angular distance between a prime grid meridian and any given meridian. Oblique longitude is angular distance between a prime oblique meridian and any given oblique meridian. Transverse or inverse longitude is angular distance between a prime transverse meridian and any given meridian. Celestial longitude is angular distance east of the vernal equinox, along the ecliptic. [1]

LONGSHORE BAR. A bar running roughly parallel to the shoreline. [14]

LOOKOUT STATION. A distinctive structure or place on shore from which personnel keep watch upon events at sea or along the coast. [17]

LOOKOUT TOWER. Any tower surmounted by a small house in which a watch is habitually kept, as distinguished from an observation tower in which no watch is kept. [17]

LORAN. The designation of a family of electronic navigational systems by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. The name 'Loran' is derived from the words 'long range navigation.' [17]

A long range, low frequency (90-110 kHz) radionavigation system by which a hyperbolic line of position of high accuracy is obtained by measuring the difference in the times of arrival of pulse signals radiated by a pair of synchronized transmitters (master station and secondary station) which are separated by several hundred miles. The time difference measurement is accomplished by using a specialized receiver to compare the leading edges of the envelopes of the received pulses (envelope match) and to compare the phases of the third cycle within each pulse (cycle match). The making of this phase comparison early in the pulse insures that the measurement is made before the arrival of corresponding skywaves. Precise control over the shape of the pulse insures reliable third cycle identification. If skywaves are to be used for time difference measurements, the receiver must be adjusted to change the phase comparison point from 30 microseconds into the pulse (beginnings of the third cycle) to an appropriate point beyond. The time difference measurements from two station pairs (master station and two secondary stations) yield two intersecting lines of position, i.e., a fix. When using the groundwave, ranges of 800 to 1200 nautical miles are obtainable, depending upon transmitter power, signal-to-noise ratio in the service area, receiver sensitivity, and losses over the signal path. The predictable accuracy (2drms) is 0.25 nautical mile or better when the propagation corrections include the additional secondary phase factor (ASF) corrections. The system provides lesser accuracy when used in the skywave mode. When the receiver is appropriately modified to enable time measurements with respect to a local time reference the system can be used in the ranging or range-range mode. [1]

LORAN RATE. Originally, the rate at which Loran signals were repeated. Now, the frequency channel and pulse repetition rate by which a pair of loran stations is identified. Also called rate. [17]

LOWER LOW WATER DATUM (LLWD). An approximation of mean lower low water that has been adopted as a standard reference for a limited area and is retained for an indefinite period regardless of the fact that it may differ slightly from a better determination of mean lower

low water from a subsequent series of observations. Used primarily for river and harbor engineering purposes. Columbia River lower low water datum is an example. [7]

LOWLAND. Low and relatively level land at a lower elevation than adjoining districts. [17]

LOW ORDER STATIONS. This category consists of control established by ground survey methods that do not meet established Third-order criteria. Included are stations positioned through the use of a sextant or planetable, and any station positioned from, or sighting on, a moving object such that repeat measurements cannot be made. [31]

LOW WATER DATUM (LWD). (1) The dynamic elevation for each of the Great Lakes and Lake St. Clair and the corresponding sloping surfaces of the St. Marys, St. Clair, Detroit, Niagara, and St. Lawrence Rivers to which are referred the depths shown on the navigational charts and the authorized depths for navigation improvement projects. Elevations of these planes are referred to IGLD (1955) and are Lake Superior - 600.0 feet, Lakes Michigan and Huron - 576.8 feet, Lake St. Clair - 571.7 feet, Lake Erie 568.6 feet, and Lake Ontario - 242.8 feet. (2) An approximation of mean low water that has been adopted as a standard reference for a limited area and is retained for an indefinite period regardless of the fact that it may differ slightly from a better determination of mean low water from a subsequent series of observations. Used primarily for river and harbor engineering purposes. Boston low water datum is an example. [7]

LOW WATER LINE. The line where the established low-water datum intersects the shore. The plane of reference that constitutes the low-water datum differs in different regions. [4]

LOXODROME. A curve, on the surface of a sphere, intersecting all great circles of the sphere at a constant oblique angle, theoretically never reaching the pole while closely approaching it. See Rhumb line. [17]

LOXODROMIC CURVE. Same as Rhumb line. [3]

LUMINOUS RANGE. The greatest distance a light can be seen given its nominal range (luminous intensity) and the existing meteorological visibility. [37]

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M

MACHINE COORDINATE. A coordinate value given in terms of a machine-dependent coordinate system, e.g., the position measured by a digitizing device without transformation into some map-related system of coordinates. [22]

MACHINE LEARNING. The ability of a device to improve its performance based on its past performance. [20]

Concerns the ability of a device to improve its performance based on its past performance. (Related to artificial intelligence.) [34]

MAGENTA CONTACT SCREEN. A contact screen which has a dye, rather than a silver, dot pattern. The dye pattern makes it possible to control halftone contrast by the use of color filters. [28]

MAGNETIC ANNUAL CHANGE. The amount of magnetic secular change undergone in 1 year. Also called annual change; annual magnetic change; annual rate; annual rate of change. [10]

MAGNETIC ANNUAL VARIATION. The small regular fluctuation in the earth's magnetism, having a period of 1 year. Also called annual magnetic variation. [10]

MAGNETIC ANOMALY. See Local Magnetic Anomaly. The difference between the intensity of the magnetic field at a particular place and the intensity predicted for that place by a standard formula, such as that for a magnetic dipole. [39]

MAGNETIC DECLINATION. The angle between the magnetic and geographical meridians at any place, expressed in degrees east or west to indicate the direction of magnetic north from true north. In nautical and aeronautical navigation the term magnetic variation is used instead of magnetic declination, and the angle is termed variation of the compass or magnetic variation. Magnetic declination is not otherwise synonymous with magnetic variation, which refers to regular or irregular change with time of the magnetic declination, dip, or intensity. Because of local attraction, the magnetic declination of two close points may differ by several degrees. [10]

MAGNETIC DISK (OR DISC) (ISO). A flat circular plate with a magnetizable surface layer on which data can be stored by magnetic recording. [20]

A flat circular plate with a magnetic surface on which data can be stored by selective polarization of portions of the surface. The surface is partitioned into a certain number of tracks in form of concentric circles, and in sectors. Data access may not only be sequentially (as on a magnetic tape), but also directly to any sector of any track. [22]

MAGNETIC DISK STORAGE (ISO). A magnetic storage in which data are stored by magnetic recording on the flat surfaces of one or more disks that rotate in use. [20]

MAGNETIC DISTURBANCE. An irregular, large-amplitude, rapid change of the Earth's magnetic field which occurs at approximately the same time worldwide. A magnetic disturbance is usually associated with the occurrence of solar flares or other strong solar activity. Also called a magnetic storm. Sometimes, the daily magnetic variation is called a magnetic disturbance. [39]

MAGNETIC MERIDIAN. The line having the direction of the magnetic needle at a given place; a vertical plane fixed by the direction taken by a perfect compass needle. [3]

MAGNETIC NORTH. The direction indicated by the north-seeking pole of a freely suspended magnetic needle, influenced only by the earth's magnetic field. [13]

MAGNETIC TAPE (ISO). A tape with a magnetizable surface layer on which data can be stored by magnetic recording. [20]

MAGNETIC TAPE, DIGITAL. A tape with a magnetic surface on which data can be stored by selective polarization of portions of the surface. A large reel of magnetic tape (2400 feet) can store sequentially about 2 million to 40 million bytes (frames) of data, depending on the writing density. [22]

MAGNETIC TAPE DRIVE (ISO). A mechanism for moving magnetic tape and controlling its movement. Synonymous with magnetic tape deck, magnetic tape transport mechanism. [20]

MAGNETIC VARIATION. A regular or irregular change, with time, of magnetic declination, dip, or intensity. In nautical and aeronautical navigation, and sometimes in surveying, the term "magnetic variation" is used for magnetic declination. The regular magnetic variations are: secular, the change from year to year in the same direction (which usually persists for many decades); annual, the change over a period of 1 year; and diurnal, the change over a period of 1 day (24 hours). Irregular variations, when sudden, worldwide, and severe, are known as magnetic storms. The earth's magnetic field also may be affected locally by direct-current electricity and other artificial disturbances. It was once a common practice of surveyors to denote as magnetic variation the net amount the compass departed from the direction taken as north in the description of a particular line, even when this was known to be slightly at variance with the celestial meridian. [39]

MAINLAND. The principal portion of a large land area. The term is used loosely to contrast a principal land mass from outlying islands and sometimes peninsulas. [1]

MAJOR AIDS TO NAVIGATION. An aid of considerable intensity, reliability, and range exhibited from fixed structures or marine sites. Major aids are classified as primary or secondary and are usually manned or remotely monitored. [37]

MAJOR LIGHT. A light of high intensity and reliability exhibited from a fixed structure or on a marine site (except range light). Major lights include primary seacoast lights and secondary lights. See also Minor Light. [1]

MAKEREADY. The adjustment of feeder, grippers, side guide, pressure between plate and blanket cylinder, impression plate, and ink fountain prior to a press run. [10]

MAKE LINE. An accurately scaled line denoting the size to which original copy is to be enlarged or reduced. [10]

MAKEUP TIME. That part of available time used for reruns due to malfunctions or mistakes during a previous operating time. Contrast with development time, production time. [9]

MANGROVE. This type includes the mangroves and stands of tree-like plants that are predominantly mangrove. These plants are perennials that frequently create an apparent shoreline. Much of this vegetation grows in the vicinity of the high waterline with overhanging and tangled growth that obscures the shoreline from both the mariner and the stereocompiler. Red mangrove, however, often grows in scattered clumps of islets in shallow water at some distance from the main shore. Mangrove is found in saltwater throughout the tropics. [31]

MAN-MADE SHORELINE. This is the line of contact between the surface of a body of water and man-made land or features provided the man-made waterline is continuous with the natural shoreline. This is intended to include as man-made shoreline the water line along breakwaters, bulkheads, fill areas, jetties, and other features built out from the land. [29]

MANUAL DIGITIZING. Digitizing which leaves the recognition and following of cartographic features entirely to the operator. [22]

MANUALLY ASSISTED DIGITIZER. A digitizer on-line to a computer system programmed for automatic recognition and/or following of cartographic features, but also allowing for manual intervention to direct its actions under certain conditions. This results in a semi-automatic digitizing process. [22]

MANUSCRIPT. The original drawing of a map as compiled or constructed from various data, such as ground surveys and photographs. [10]

MAP. A representation, usually on a plane surface, of all or part of the surface of the earth, celestial sphere, or other area; showing relative size and position, according to a given projection, of the physical features represented and such other information as may be applicable to the purpose intended. Such a representation intended primarily for navigational use is called a chart. A method of representing all or part of the surface of a sphere or spheroid, such as the earth, upon a plane surface is called a map projection. A planimetric map indicates only the horizontal positions of features; a topographic map both horizontal and vertical positions. A topographic map showing relief by means of contour lines drawn at regular height intervals is called a contour map. A relief map emphasizes relative elevations or relief; a three-dimensional relief map is called a relief model. The pattern on the underside of extensive cloud areas, created by the varying amounts of light reflected from the earth's surface, is called a sky map. A chart which shows the distribution of meteorological conditions over an area at a given moment may be called a weather map. [1]

Graphic representation of the physical features (natural, artificial, or both) of a part or the whole of the earth's surface, by means of signs and symbols or photographic imagery, at an established scale, on a specified projection and with the means of orientation indicated. [25]

MAP ACCURACY STANDARDS. See United States National Map Accuracy Standards. [1]

MAPPING, CHARTING AND GEODESY. The collection, transformation, generation, dissemination, and storing of geodetic, geomagnetic, gravimetric, aeronautical, topographic, hydrographic, cultural, and toponymic data. These data may be used for military planning, training, and operations including aeronautical, nautical, and land navigation, as well as for weapon orientation and target positioning. Mapping, charting and geodesy (MC&G) also includes the evaluation of topographic, hydrographic, or aeronautical features for their effect on military operations or intelligence. The data may be presented in the form of topographic, planimetric, relief, or thematic maps and graphics; nautical and aeronautical charts and publications; and in simulated, photographic, digital, or computerized formats. [1]

MAP DIGITIZATION. Conversion of map data from graphic to digital form. [25]

MAP BATHYMETRIC. Map delineating the form of the bottom of a body of water, or a portion thereof, by the use of depth contours (isobaths). [25]

MAP CONTENT. Everything shown on a map. It is to be distinguished from (map) detail which is the basic graphic representation of features and phenomena. [21]

MAPPING CONTROL. Is a system of points or stations with established positions and/or elevations which are used as fixed references in positioning and correlating map features. The term "station" refers to the control on the ground. The term "point" refers to the control on a photograph. The accuracy of the control upon which a mapping project is based has an important bearing on the final accuracy of the project. National Geodetic Survey requirements state that a survey of given order must be based on control of similar or higher order. This concept is expanded as applied to field edit to include all surveys, not only those relating to geodetic work. The general guideline for control selection is that control must be at least as accurate as the desired accuracy of positions to be determined from this control. [31]

MAP EDITING. The process of checking a map or chart in its various stages of preparation to ensure accuracy, completeness, correct preparation and interpretation of sources used, and legible and precise reproduction. [21]

MAP FILE. A graphics file containing all data necessary for the digital description of a map image. [22]

MAP GRID. A grid superposed on a map to provide a coordinate system more convenient than that provided by the graticule. [39]

MAP, HYPSOMETRIC. Map showing relief by any convention, such as contours, hachures, shading, or tinting. [25]

MAP, PLANIMETRIC. A map which shows only the horizontal positions of the features represented. Unlike a topographic map, a planimetric map does not show relief in measurable form. Natural features usually shown include rivers, lakes, and seas; mountains, valleys, and plains; forests, prairies, marshes, and deserts. Cultural features shown include

cities, farms, transportation routes, and public utility facilities; and political and private boundary lines. [39]

MAP, ISOGONIC. A map showing lines of constant magnetic inclination for a particular base data (shown on the map). Lines of equal annual change in declination are generally also shown. If the map is designed for use in navigation, it is called an isogonic chart. [29]

MAP PRODUCTION. All processes in the design, compilation, draughting and reproduction of a map. [21]

MAP PROJECTION. An orderly system of lines on a plane representing a corresponding system of imaginary lines on an adopted terrestrial or celestial datum surface. Also the mathematical concept of such a system. For maps of the earth, a projection consists of a network (graticule) of lines representing parallels of latitude and meridians of longitude, or of a grid based on such parallels and meridians. A map projection may be derived by geometrical construction or by mathematical analysis. The mathematical concept of map projection is the mathematical principle upon which it is based, expressed as formulas for computing the elements of the projection and tables used in constructing its graphical representation (graticule or grid). Projections derived by mathematical analysis are generally used for maps constructed with survey data. Map projections vary considerably in their characteristics, according to the qualities which they preserve in the mapping, and the methods by which this is accomplished. They are classified (1) according to the characteristics which they preserve, as conformal, equal area, azimuthal, etc.; (2) according to the methods used in their development, as polyconic, gnomonic, stereographic, etc.; and (3) according to the names of their authors, often coupled with some characteristic, as Mercator, Bonne, Lambert with two standard parallels, etc. The various map projections are defined under their particular designations. [8]

A systematic drawing of lines on a plane surface to represent the parallels of latitude and the meridians of longitude of the earth or a section of the earth. A map projection may be established by analytical computation or may be constructed geometrically. A map projection is frequently referred to as a "projection" but the complete term should be used unless the context clearly indicates the meaning. [10]

MAP PROJECTION, MERCATOR. A conformal map projection of the so-called cylindrical type. The equator is represented by a straight line true to scale; the geographic meridians are represented by parallel straight lines perpendicular to the line representing the equator; they are spaced according to their distance apart at the equator. The geographic parallels are represented by a second system of straight lines perpendicular to the family of lines representing the meridians, and therefore parallel with the equator. Conformality is achieved by mathematical analysis, the spacing of the parallels being increased with increasing distance from the equator to conform with the expanding scale along the parallels resulting from the meridians being represented by parallel lines. The Mercator map projection is considered one of the most valuable of all map projections, its most useful feature being that a line of constant bearing (azimuth) on a sphere is represented on the projection by a straight line. It is not a perspective projection on a cylinder, and is not developed geometrically. [8]

MAP PROJECTIONS, CLASSIFICATION OF. Map projections are classified in a variety of ways. The most common are the following. (a) A map projection cannot preserve all geometric relationships on the curved surface, but it can preserve one or more of them. A conformal map projection preserves angles; an equal-area map projection preserves areas, an azimuthal map projection preserves azimuths from a point; and an equidistant map projection preserves distances from a particular point or a particular line. (b) Map projections often map the ellipsoid onto the plane by using a developable surface as intermediary. In a cylindrical map projection the ellipsoid is first mapped onto a cylinder; in a conical map projection the ellipsoid is first mapped onto a cone. Projections directly onto a plane are not designated as such, but are classified according to the location of the center of projection, location of the plane, etc. Many other schemes of classification exist; the most used are those of Maurer (1935) and Tobler (1962), but the schemes of Wray (1974) and Chovitz (1952) also have many merits. [39]

MAP RELIEF. A map whose surface is shaped to represent topography in a region. The most common kind is the plastic relief-map. This is made by printing an ordinary topographic map on a plastic sheet, which is then placed on a plaster mold that has been carved to represent the topography. Heat and pressure are applied to fix the plastic sheet permanently into the shape of the mold. Another kind, less common and more costly but showing more detail in greater accuracy, is the solid relief-map, made by carving the topography, etc., in a suitable substance such as plaster, and then painting or drawing further detail on the model. Also called a terrain model or relief model. [39]

MAP SCALE, EQUIVALENT. An equivalent scale is the relationship which a small distance on the map bears to the corresponding distance on the earth, expressed as an equivalence. Usually, but not necessarily, the equivalence is expressed in different specified units; for example, 1 inch (on the map) equals 1 mile (on the ground). Or the abbreviated forms, "inch to the mile" and "mile to the inch," the former is preferred. Infrequently called verbal scale. [8]

MAP SCALE, FRACTIONAL. A fractional scale is the ratio which any small distance on the map bears to the corresponding distance on the earth. It may be written in the form of a fraction: 1/10,000; or as a proportion, 1:10,000. Very infrequently called numerical scale, natural scale, and linear scale. These terms are not recommended. Fractional scales are representative in any linear units. Usually the term representative fraction however, is applied to a fractional scale whose numerator is unity (1) and is frequently referred to as the "R.F." of the map. For a map of large scale, the representative fraction has a small denominator; for a map of small-scale, the representative fraction has a large denominator. [8]

MAP SCALE, GRAPHIC (OR BAR). A line on a map subdivided and marked with the distance which each of its parts represents on the earth. [8]

MAP SPECIFICATION. A document which sets out the standards to be adhered to in the production of a particular map or series and which describes, or represents, the sheet layout, marginal information, symbols, lettering and colors to be adopted. All maps which conform to the same standards are said to be produced to a common specification. [21]

MAP, TOPOGRAPHIC. (1) A map showing the horizontal and vertical locations of natural and

artificial features. It is distinguished from a planimetric map by the presence of quantitative symbols showing the relief. A topographic map usually shows the same features as a planimetric map, but uses numbered contour lines or comparable symbols to indicate elevations of mountains, valleys, and plains; in the case of hydrographic charts, symbols and numbers are used to show depths in bodies of water. A topographic map differs from a hypsographic map in that, on the latter, vertical distances are shown with respect to the geoid, while on the former, vertical distances may be shown with respect to any specified surface. (2) A map whose principal purpose is to portray and identify the natural or artificial features of the Earth's surface as faithfully as possible within the limitations imposed by scale. [39]

MARGIN DATA. All explanatory information given in the margin of a map or chart which clarifies, defines, illustrates, and/or supplements the graphic portion of the sheet. Also called border data; border information; margin information. [10]

MARGINAL SEA (ALSO CALLED TERRITORIAL SEA, ADJACENT SEA, MARINE BELT, MARITIME BELT, AND 3-MILE LIMIT). The water area bordering a nation over which it has exclusive jurisdiction, except for the right of innocent passage of foreign vessels. It is a creation of international law, although no agreement has thus far been reached by the international community regarding its width. It extends seaward from the low-water mark along a straight coast and from the seaward limits of inland waters where there are embayments. The United States has traditionally claimed 3 nautical miles as its width and has not recognized the claims of other countries to a wider belt. [3]

MARGINAL WHARF. A wharf flush with the general adjacent shoreline and normally of concrete or asphalt decking atop open pile supports. This is the predominate type of modern general cargo wharf. [15]

MARIGRAM. A graphic record of the rise and fall of the tide. The record is in the form of a curve, in which time is generally represented on the abscissa and the height of the tide on the ordinate. [1]

MARINA. A harbor facility for small boats, yachts, etc., where supplies, repairs, and various services are available. [1]

MARINE. An adjective meaning relating to navigation or shipping; relating to or connected with the sea; used, or adopted for use at sea. Sometimes called maritime, but maritime is more frequently applied to that which borders on the sea. [36]

MARINE CHART. See Nautical Chart. [1]

MARINE LEAGUE. A measure of distance over the water; equals 3 nautical or geographic miles. [3]

MARINE MILE. Same as Nautical Mile. [3]

MARINE RAILWAY. A marine railway is a track, cradle, and winding mechanism for hauling vessels out of the water so that the hull can be exposed as in a dry dock. This is also called a patent slip in British terminology. [31]

MARINE TECHNOLOGY SOCIETY (MTS). A nonprofit organization for persons with a professional interest in the marine field, TMS was founded in 1963. In 1971 it absorbed the American Society for Oceanography (ASO), formed in 1965. MTS includes 21 committees, each specializing in a separate field. It comprises many local sections throughout the United States and Canada. The Los Angeles regional section is identified as MTS/LARS, and the Southern New England section as SNEMTS. The several sections in the Pacific region form the Pacific Rim Alliance (PACRIM). [38]

MARINE VEGETATION. For NOS charting purposes, marine vegetation refers to permanent or semi-permanent vegetation or areas of vegetation growing at or seaward from the shoreline and presenting some significance to the mariner. Marine vegetation may create an apparent shoreline, but sufficiently dense so as to impede the progress of a vessel, or have some other significance such as the association of kelp with rocks. [31]

MARITIME BOUNDARY. A water boundary. See National Boundary. [3]

MARK. (Surveying) A definite object, such as an imprinted metal disk, used to designate a survey point and sometimes refers to the entire survey monument. Mark is used with a qualifying term such as station, reference, or bench. See also bench mark; reference mark. [10]

MARKER. A small automatic radiobeacon with a range of 4 to 6 miles located on a buoy, pierhead, or piling structure. It is not intended for long-range accurate bearings but serves as a local mark indicating a channel entrance, turning point, pierhead, etc., in or near a harbor. The use of two or more beacons provides a "fix." [36]

That which marks something. A marker beacon. See also Radiobeacon. [17]

A term used to describe an aid intended as a guide for normal surface navigation. It is generally used to refer to any private unlighted or lighted fixed aid to navigation not established or maintained by the U.S. Coast Guard and not listed in the Coast Guard Light List, which is erected to mark minor channels. The term may also refer to markers for other specific purposes (e.g., measured mile markers or dredging range). [29]

MARKER BUOY. A temporary buoy used in surveying to mark a location of particular interest such as a shoal or reef. See also Station Buoy. [17]

MARSH. Marsh is an area of wet, often spongy ground that is subject to frequent flooding or tidal inundations, but not considered to be continually underwater. It is characterized by the growth of nonwoody stemmed, vascular plants such as the bullrushes, cordgrasses, reeds, and other wetland species, and by the lack of trees. Marsh often forms a transition between the open water and the dry uplands and is frequently associated with an apparent shoreline. [31]

A tract of low, wet ground, usually miry and covered with rank vegetation. It may, at times be sufficiently dry to permit tillage or haycutting, but requires drainage to make it permanently arable. [4]

MASK. In photomechanical processing, to block out an area by means of actinically opaque material, to prevent exposure in the part blocked out. Also, the covering material itself when so applied. (2) A clear stable base plastic, coated with an opaque stratum which can be

peeled off between photographically etched outline images, thus producing an open window negative of the desired area. This process of masking is often identified by the trade name of the material used. (3) A continuous-tone positive or negative made from an original negative or positive for the purpose of altering the image produced from the original. Used to alter contrast, correct color portrayal, or produce pictotone or pictoling images. [10]

MASTER FILE (ISO). A file that is used as an authority in a given job and that is relatively permanent, even though its contents may change. Synonymous with main file. [20]

(1) A file of relatively more permanent information, which is usually updated periodically. (2) A main reference file of information. [34]

MATCHING. The act by which detail or information on the edge, or overlap area, of a map or chart is compared, adjusted, and corrected to agree with the existing overlapping chart. [10]

MATRIX. (1) (ISO) A rectangular array of elements, arranged in rows and columns, that may be manipulated according to the rules of matrix algebra. (2) By extension, an array of any number of dimensions. (3) In computers, a logic network in the form of an elements connected at some of their intersections. [20]

(1) A rectangular array of numbers subject to mathematical operations, such as addition, multiplication, and inversion, according to specified rules. Any table is a matrix. (2) An array of circuit elements such as diodes, wires, magnetic cores, and relays, arranged and designed to perform a specified function; for example, conversion from one number system to another. [34]

MATTRESS. Mass of interwoven brush, poles, etc., used to protect a bank from erosion. [4]

MEAN HIGHER HIGH WATER (MHHW). A tidal datum. The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch. [7]

MEAN HIGH WATER (MHW). A tidal datum. The average of all the high water heights observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch. [7]

MEAN HIGH WATER LINE (MHWL). The line on a chart or map which represents the intersection of the land with the water surface at the elevation of mean high water. See Shoreline. [7]

MEAN LOWER LOW WATER (MLLW). A tidal datum. The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch. [7]

MEAN LOW WATER (MLW). A tidal datum. The average of all the low water heights observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous

observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch. [7]

MEAN LOW WATER LINE (MLWL). The line on a chart or map which represents the intersection of the land with the water surface at the elevation of mean low water. [7]

MEAN RANGE OF TIDE (MN). The difference in height between mean high water and mean low water. [7]

MEAN SEA LEVEL (MSL). A tidal datum. The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; e.g., monthly mean sea level and yearly mean sea level. [7]

The average height of the surface of the sea for all stages of the tide over a 19-year period, usually determined from hourly height readings. A determination of mean sea level that has been adopted as a standard for heights is called a sea level datum. The sea level datum now used for the National Ocean Service level net is officially known as the Sea Level Datum of 1929, the year referring to the last general adjustment of the net, and is based upon observations taken over a number of years at various tide stations along the coasts of the United States and Canada. See Nineteen-Year Tidal Cycle. [3]

MEAN TIDE LEVEL. Same as Half-Tide Level. [3]

MEASURED MILE. A length of 1 nautical mile the limits of which have been accurately measured and are indicated by ranges ashore. It is used by vessels to calibrate logs, engine revolution counters, etc., and to determine speed. [1]

MEDIUM RANGE SYSTEMS. Those radionavigation systems providing positioning capability beyond the range of short range systems, but their use is generally limited to ranges permitting reliable positioning for about 1 day prior to making landfall; Decca is an example. [1]

MENU (SYSTEM). An array of functions at the disposal of the user and often redefinable by the user. Frequently used to assigned feature codes. They may be activated by means of hardware switches, light buttons on a display image or user specified rectangular fields on a digitizer or tablet. In the last case a position digitized in one of these fields is equivalent to pressing a function key. [22]

MENU TECHNIQUE. The use of a menu for input of commands or data. [22]

MERCATOR'S CHART. A chart built on the principles of mercator's projection, upon which any rhumb line appears as a straight line. Such a chart is constructed by representing the parallels of latitude at proper intervals, as parallel, horizontal, straight lines, and drawing the meridians perpendicular to the parallels.

On such a chart all the meridians have the same direction and any straight line will cut all meridians at the same angle. But, as on the earth's surface all meridians constantly converge from the equator to the poles, whereas on the chart they are represented as parallel, it is immediately apparent that, except at the equator, all areas have more or less been distorted, and the higher the latitude the greater is the amount of distortion. [36]

MERCATOR MAP PROJECTION. A conformal cylindrical map projection in which the surface of a sphere or spheroid, such as the earth is conceived as developed on a cylinder tangent along the equator. Meridians appear as equally spaced vertical lines and parallels as horizontal lines drawn farther apart as the latitude increases, such that the correct relationship between latitude and the longitude scales at any point is maintained. The expansion at any point is equal to the secant of the latitude of that point, with a small correction for the ellipticity of the earth. The Mercator is not a perspective projection. Since rhumb lines appear as straight lines and directions can be measured directly, this projection is widely used in navigation. If the cylinder is tangent along a meridian, a transverse mercator map projection results; if the cylinder is tangent along an oblique great circle, an oblique mercator map projection results. Also called equatorial cylindrical orthomorphic map projection. [1]

MERCATOR PROJECTION. A conformal map projection upon a plane, in which the latitude and longitude lines are straight parallel lines intersecting each other at right angles, and in which the meridians of longitude are spaced equally throughout the map, based on their distance apart at the equator, and the distances between parallels are derived by a mathematical analysis, their spacing bearing an exact relationship to the spreading of the meridians along a corresponding parallel. [3]

MERGE. An operation performed on two or more ordered sets of records to create a single set in one file. [22]

MERGED (DIGITAL DATA). A term used in the Photogrammetry Branch referring to the combination of two or more digital files by automated data processing techniques. The process generates one digital file which is equal in the number of data records to the sum of the individual files before merging. Merged digital files may be the combination of digital data files representing different stereographic models or a combination of digital data files created from the same stereographic model.

Examples of merged digital data files are: (1) digital discrete point and linear data from different stereographic models merged to provide one digital file which represent a photogrammetric survey of a specified geographic area, (2) a merge of digital photobathymetric data files to provide one digital file for plotting machine processing in the generation of a photobathymetric data overlay. [32]

MERIDIAN. A north-south reference line, particularly a great circle through the geographical poles of the earth. The term usually refers to the upper branch, the half, from pole to pole, which passes through a given place; the other half being called the lower branch. An astronomical (terrestrial) meridian is a line connecting points having the same astronomical longitude. A geodetic meridian is a line connecting points of equal geodetic longitude. Geodetic and sometimes astronomical meridians are also called geographic meridians. Geodetic meridians are shown on charts. The prime meridian passes through longitude 0°. Sometimes designated true meridian to distinguish it from magnetic meridian, compass meridian, or grid meridian, the north-south lines relative to magnetic, compass, or grid direction, respectively. A fictitious meridian is one of a series of great circles or lines used in place of a meridian for certain purposes. A transverse of inverse meridian is a great circle perpendicular to a transverse equator. An oblique meridian is a great circle perpendicular to an oblique equator. Any meridian used as a reference for reckoning time is called a time meridian. The meridian used for reckoning standard, zone, daylight saving, or war time is called standard, zone

daylight saving, or war meridian, respectively. The meridian through any particular place or observer, serving as the reference for local time, is called local meridian, in contrast with the Greenwich meridian, the reference for Greenwich time. A celestial meridian is a great circle of the celestial sphere, through the celestial poles and the zenith. Also called circle of latitude. [1]

MERIDIAN, CENTRAL. (1) The line of constant longitude at the center of a graticule. The central meridian is usually used as a base for constructing the other lines of the graticule. (2) The meridian used as y-axis in computing tables for a State plane coordinate system. The central meridian of the coordinate system usually passes close to the geometric center of the region or zone for which the tables are computed but, to avoid the use of negative values, is given a large positive value which must be added to all x-coordinates. (3) A line that represents a meridian on a graticule and that is an axis of symmetry for the geometric properties of the graticule. [39]

MERIDIANS. Imaginary planes passing through the poles and measure longitudes east or west of the principal meridian of Greenwich. See Longitude. [3]

MERIDIONAL DIFFERENCE. The difference between the meridional parts of any two given parallels. This difference is found by subtraction if the two parallels are on the same side of the equator, and by addition if on opposite sides. Also called difference of meridional parts. [1]

MERIDIONAL PARTS. The length of the arc, expressed in units of 1 minute of longitude at the equator, of a meridian between the Equator and any parallel of latitude on the graticule of the Mercator map projection. [39]

MERIDIONAL PARTS, TABLE OF. A table listing distances along the geodetic meridian from the Equator to various latitudes and the ratio, for each of the latitudes, of the length of one minute of latitude to the length of one minute of longitude at the Equator. On a sphere, at the Equator, the length of a minute of longitude is equal to the length of a minute of latitude, but on approaching the poles the length of a minute of longitude steadily decreases. Because the Earth is usually represented by a ellipsoid rather than by a sphere, the above conditions do not exactly fit. However, in the graticule of the Mercator map projection, the minutes of longitude are made to appear of the same length for all latitudes, so it becomes necessary, in order to preserve existing proportions between lengths of the parallel and of the meridian at various latitudes, to increase the distances between latitudes along the meridian; such increases are greater and greater, the higher the latitude. The length of the meridian, thus increased, constitutes the number of the meridional part corresponding to that latitude. A table of meridional parts found in books on navigation can be used for constructing a Mercator map projection, and for solving problems in sailing. A close approximation to the value of a meridional part on an ellipsoid at a given latitude is obtained by computing the meridional part of the corresponding geocentric latitude. [39]

MESA. A flat-topped, rocky hill with steep sides. (Southwestern U.S.) [4]

METER. The base unit of length in the International System of Units, equal to 1,650,763.73 wavelengths in vacuum of the radiation corresponding to the transition between the levels 2p10 and 5d5 of the krypton-86 atom. It is equal to 39.37008 inches, approximately, or

approximately one ten-millionth of the distance from the equator to the North or South Pole. The old international prototype of the meter is still kept at the International Bureau of Weights and Measures under the conditions specified in 1889. [1]

METER, COMMITTEE. An iron bar of 1 meter length, which was brought to America in 1805 by Ferdinand R. Hassler, the first superintendent of the U.S. Coast Survey, for use as a standard of length. It was one of sixteen such bars calibrated by the Committee on Weights and Measures in Paris in 1799 against the Metre des Archives. It served as the standard of length for geodetic surveys in this country until 1889 or 1890, when it was replaced by the National Prototype Meter. The Committee Meter was presented by Hassler to the American Philosophical Society in Philadelphia. [39]

METEOROLOGICAL VISIBILITY. The greatest distance at which a black object of suitable dimension could be seen and recognized against the horizon sky by day. [37]

METES AND BOUNDS. The boundary lines or limits of a tract of land. One of the oldest methods of describing land and was used to transfer lands in the Thirteen Original Colonies. Defined variously in law dictionaries as: the boundary lines of land, with their terminal points and angles; the boundary lines and corners of a piece of land; and the boundary lines of lands with their terminating points or angles. [3]

A method of describing a parcel of land by citing the owners of abutting lands and describing the length of each course of a boundary as "along" some apparent line, such as, "along a stream" or "along the road." In modern usage, a metes and bounds description includes the bearings and distances of each course. [26]

METONIC CYCLE. A period of almost 19 years or 235 lunations. Devised by Meton, an Athenian astronomer who lived in the fifth century B.C., for the purpose of obtaining a period in which new and full Moon would recur on the same day of the year. Taking the Julian year of 365.25 days and the synodic month as 29.530,588 days, we have the 19-year period of 6,939.75 days as compared with the 235 lunations of 6,939.69 days, a difference of only 0.06 day. [7]

METRIC SYSTEM. Decimal system of weights and measures based on the meter as a unit length and the kilogram as a unit mass. [25]

MICRON. One-millionth of a meter. Properly called a micrometer. The term "micron" is not approved for the SI. [39]

MICROWAVE. A very short electromagnetic wave, usually considered to be about 30 centimeters to 1 millimeter in length. While the limits are not clearly defined, it is generally considered as the wavelength of a radar operation. [1]

MICROWAVE TOWER. A tower which carries microwave broadcasters and receivers, usually parabolic, used in the transmission of communications signals. [35]

MID-CHANNEL BUOY. See Fairway Buoy. [1]

MIDDLE LATITUDE. Half the arithmetical sum of the latitudes of two places on the same side of the equator.

MIDDLE TONES. In general, the tones in a reproduction between the highlights and shadows. [28]

MIL. (1) 1/6400 of the circumference of a circle. Approximately 1/1000 radian. (2) 1/1000 of an inch. [39]

MILE. A unit of distance. The nautical mile, or sea mile, is used primarily in navigation. Nearly all maritime nations have adopted the International Nautical Mile of 1,852 meters proposed in 1929 by the International Hydrographic Bureau. The U.S. Departments of Defense and Commerce adopted this value on July 1, 1954. Using the yard-meter conversion factor effective July 1, 1959, (1 yard = 0.9144 meter, exactly) the International Nautical Mile is equivalent to 6076.11549 feet, approximately. The geographical mile is the length of 1 minute of arc of the equator, considered to be 6,087.08 feet. The statute mile or land mile (5,280 feet in the United States) is commonly used for navigation on rivers and lakes, notably the Great Lakes of North America. [1]

A unit of distance, variously defined. See mile, nautical and mile, statute. The word mile is derived from the Latin "mille" (one thousand), and meant one thousand paces of about 5 feet each. The mile of the Romans thus was about 5000 feet long, a value that suffered many changes as the mile came into use among the other western nations. In general usage, "mile" means the statute mile of 5,280 feet. The nautical mile is almost never referred to simply as a "mile" unless the meaning is obvious from context. [39]

MILEAGE NUMBER. Assigned to aids and gives the distance in sailing miles along the river from a reference point to the aid. Principally used in the Mississippi River System. [37]

MILE, INTERNATIONAL NAUTICAL. The nautical mile defined as exactly 1,852 meters length. It was proposed in 1929 by the International Hydrographic Bureau because of the variety of nautical miles then in use. It has since been adopted by most maritime nations, and, on July 1,1954, by the U.S. Department of Commerce and the U.S. Department of Defense. [39]

MILE, NAUTICAL. The United States nautical mile is defined as equal to the length of one-sixtieth of a degree of a great circle on a sphere having an area equal to the area of an ellipsoid representing the Earth's surface. Its value, calculated for the Clarke spheroid of 1866, is 1,853.248 m (6,080.2 ft);(compare with the international nautical mile of 1,852 m (6,076.1 ft)). The United States nautical mile is also called a sea mile, a geographical mile, and a geographic mile. It may be taken as equal to the length of a minute of arc along the Equator or a minute of latitude anywhere on a map. The nautical mile is used principally for stating distances over water. It is the unit of length used for defining the knot, a unit of speed defined as 1 nautical mile per hour. [39]

MILE, STATUTE. A unit of length defined to be exactly 5,280 feet. It is used principally in stating distances on land. [39]

MILITARY GRID. Two sets of parallel lines intersecting at right angles and forming squares; the grid is superimposed on maps, charts, and other similar representations of the earth's surface in an accurate and consistent manner to permit identification of ground locations with respect to other locations and the computation of direction and distance to other points. See also military grid reference system. [10]

MILITARY GRID REFERENCE SYSTEM (MGRS). A system which uses a standard-scaled grid square, based on a point of origin on a map projection of the earth's surface in an accurate and consistent manner to permit either position referencing or the computation of direction and distance between grid positions. See also military grid. [10]

MINERALS. "Minerals" includes oil, gas, sulphur, geopressured-geothermal and associated resources, and all other minerals which are authorized by an Act of Congress to be produced from "public lands" as defined in section 103 of the Federal Lands Policy and Management Act of 1976 (43 U.S.C. 1702 (e)). [2]

MINERALS MANAGEMENT SERVICE (MMS). The Minerals Management Service was created in 1982 for two purposes. First, the Minerals Management Service is responsible for establishing an effective means of collecting revenues generated from mineral leases offshore and on federal and Indian lands throughout the country. Second, the Service is charged with the orderly development of America's offshore energy and mineral resources while properly safeguarding the environment.

These funds are distributed to Indian Tribes and allotted States, the Land and Water Conservation Fund, the Historic Preservation Fund, and the general Treasury. The Service conducts all leasing and resource management functions for the nation's Outer Continental Shelf. The Minerals Management Service leases offshore areas for exploration and production and closely monitors drilling and production activities to protect our coastal environments and ensure proper royalty collection. [29]

MINI-RANGER III SYSTEM. A compact, light, and mobile distance measuring system manufactured by Motorola, Inc. The system operates on the basic principle of pulse radar. A transmitter aboard the survey vessel interrogates transponders at known locations. Elapsed time between transmitted interrogations and the reply from each transponder is used as the basis for determining range to each transponder. This range information together with the known location of each transponder can be trilaterated to provide the position of the survey vessel. [1]

MINOR AID TO NAVIGATION. An unmanned, unmonitored light on a fixed structure showing usually low to moderate intensity; generally fitted with light characteristics and dayboards in accordance with its lateral significance in the waterway. [37]

MINOR LIGHT. An automatic unmanned light on a fixed structure usually showing low to moderate intensity. Minor lights are established in harbors, along channels, along rivers, and in isolated locations. See also Major Light. [1]

MISTAKE. A human action that produces an unintended result. Contrast with error, fault, malfunction.

MOAT. An annular depression that may not be continuous, located at the base of a seamount or an island. [4]

MOBILE. "Mobile offshore drilling unit" or "MODU" means a vessel, other than a public vessel of the Untied States, capable of engaging in drilling operations for exploration or exploitation of subsea resources. [2]

MOBILE HOIST. A device for hauling out small craft and moving them over land to cradles or to the place at which their hulls and underwater appendages are cleaned, painted, or repaired. It consists of a self-powered steel frame on rubber tires, with two slings suspended from electric hoists. The lift is run out onto a trackway extending over the water, the slings are lowered beneath the water, and the boat is positioned over the slings; the hoists then raise the slings (and the boat) above the trackway and ground, and the lift backs off the trackway. [15]

MODEM (ISO). A functional unit that modulates and demodulates signals. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities. Modem is a contraction of modulator-demodulator. [20]

Acronym for Modulator Demodulator unit. A modem is a device that converts data from a form which is compatible with data-processing equipment to a form that is compatible with transmission facilities, and vice-versa. [34]

MODIFIED ROUTE CHARTS. These U.S. National Ocean Service charts are versions of Intracoastal Waterway charts that were originally issued in a conventional chart format. They are identical in construction and format to the area chart, and are used for some areas not adaptable to route chart style for long, narrow waterways. [29]

MODULATION RATE (ISO). The reciprocal of the measure of the shortest nominal time interval between successive significant instants of the modulated signal. If this measure is expressed in seconds, this rate is given in baud. [20]

MOIRE' PATTERN. The pattern formed by transmitting light through two separate, overlapping families of parallel lines. As one family is translated or rotated with respect to the other, the pattern shifts or otherwise changes. Because a small change in relative position of the two families can cause a large apparent change in the pattern the principle has been used extensively in measuring-engines. Also called Moire' fringes. [39]

MOLE. Is a form of breakwater alongside which vessels may lie on the sheltered side only; in some cases it may lie entirely within an artificial harbour, permitting vessels to lie along both sides. [16]

A structure, usually massive, on the seaward side of a harbor for its protection against current and wave action, drift ice, sanding up, wind, etc. Sometimes is may be suitable for the berthing of ships. See also Jetty; Quay. [1]

MONUMENT (U.S. terminology). In surveying, a structure used or erected to mark the position of a station; permanence is implied. [17]

MOORING. A place where a vessel may be secured.
(Usually in pl.) The equipment used to secure a vessel.
The process of securing a vessel, other than anchoring with a single anchor. [17]

MOORING BUOY. A buoy secured to the bottom by permanent moorings and provided with means for mooring a vessel by use of its anchor chain or mooring lines. [1]

MORSE CODE LIGHT. A light in which the appearances of light of two clearly different durations are grouped to represent a character or characters in the Morse code. [1]

MORAINE. Any accumulation of loose material deposited by a glacier. [4]

MOSAIC. An assembly of aerial photographs whose edges have been feathered and matched to form a continuous photographic representation of a portion of the earth's surface. Maps can be mosaiced for compilation purposes. [26]

MOUND. A low hill of earth, natural or artificial; in general, any prominent, more or less isolated hill. [4]

MOUNT. A large hill or mountain, usually a detached, characteristically conical mass of earth. The term 'mount' is always used instead of mountain when it precedes a proper name. [17]

MOUNTAIN. A natural elevation of the earth's surface rising more or less abruptly from the surrounding level, and attaining an altitude which, relatively to adjacent elevations, is impressive or notable. [17]

MOUNTAIN RANGE. A series of connected and aligned mountains or mountain ridges. [4]

MOUSE (ISO). In computer graphics, a hand-held locator operated by moving it on a flat surface. A mouse generally contains a control ball or a pair of wheels. [20]

MOUTH. The place of discharge of a stream into the ocean or entrance to a bay from the ocean. [17]

MUSKEG. A bog or marsh. Local in north central United States, Canada, and Alaska. [4]

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NARROWS. A navigable narrow part of a bay, strait, river, etc. [17]

NATIONAL ACADEMY OF SCIENCE-NATIONAL ACADEMY OF ENGINEERING-NATIONAL RESEARCH COUNCIL (NAS-NAE-NRC). A National Academy of Sciences (NAS) was established as a quasi-official agency in 1863 to further science and its use for the general welfare. The National Academy of Engineering (NAE) was established by the Council of NAS in 1970 to further engineering research in support of national needs. Both are honorary bodies, but can, by terms of the charter, be called upon to act as official advisers to the Federal Government in matters coming under their purview. The National Research Council (NRC) was organized by NAS in 1916 and serves as the principal operating agency of NAS and NAE. It comprises a number of boards and committees. Those associated with NAS include the Ocean Sciences Board (NAS/OSB); the Transportation Research Board (NAS/TRB); the Environmental Studies Board (NAS/ESB); and the Geophysical Research Board (NAS/GRB). [38]

NATIONAL ADVISORY COMMITTEE ON OCEANS AND ATMOSPHERE (NACOA). The Marine Resources and Engineering Development Act (MREDA) of 1966 authorized the establishment of two complementary bodies, the National Council on Marine Resources and Engineering Development (NCMRED) and the Commission on Marine Science, Engineering and Resources (CMSER). NCMRED was composed of Government officials; in contrast, CMSER was composed largely of advisers outside the Federal Government. Chaired by Julius A. Stratton of the Ford Foundation and more frequently referred to as the Stratton Commission, its aims were to formulate a national program for marine science affairs and to recommend a place for Government organizations in support of the program. Its plan was published in the report "Our Nation and the Sea," referred to as the "Stratton Report." Upon publication of the plan in 1969, the Commission ceased to exist.

NCMRED proposed the establishment of a National Advisory Committee on Oceanography (NACO). Its proposal was broadened to reflect the creation of the National Oceanic and Atmospheric Administration (NOAA), enacted by Public Law 92-115, dated August 16, 1971, which also authorized the establishment of the National Advisory Committee on Oceans and Atmosphere (NACOA). Originally to comprise 25 members, it was recently reorganized to 18 members appointed by the President from the private sector. It is responsible for a continuing review of the progress of marine and atmospheric science and service programs of the United States. It advises the Secretary of Commerce with respect to NOAA's mission and whether the mission is being fulfilled. NACOA was directed to submit a comprehensive annual report to the President and Congress setting forth an overall assessment of the status of the Nation's marine and atmospheric activities. Its proposals include the establishment of an Institute for Engineering Research in the Oceans (IERO) to be administered by NOAA, the establishment of a Marine Affairs Council (MAC) at the cabinet level, and establishment of an independent agency for ocean and atmospheric sciences. Another advisory board is the Outer Continental Shelf Advisory Board (OCSAB), established in 1975 and composed of representatives from the Departments of Defense, Energy, and Transportation, and the Environmental Protection Agency. [38]

NATIONAL BOUNDARY. The seaward boundary of the United States within which it exercises exclusive sovereignty except for the right of innocent passage of foreign vessels; the 3-mile limit. See Marginal Sea. [3]

NATIONAL GEODETIC VERTICAL DATUM. A fixed reference adopted as a standard geodetic datum for heights in the United States. The datum was derived for land surveys from a general adjustment of the first order level nets of both the United States and Canada. In the adjustment 21 tide stations in the United States and 5 in Canada were held as fixed. The geodetic datum now in use in the United States is the National Geodetic Vertical Datum of 1929. The year indicates the time of the last general adjustment. The geodetic datum is fixed and does not take into account the changing stands of sea level. Because there are many variables affecting sea level, and because the geodetic datum represents a best fit over a broad area, the relationship between the geodetic datum and local mean sea level is not consistent from one location to another in either time or space. For this reason, the National Geodetic Vertical Datum should not be confused with mean sea level. [1]

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA). The National Oceanic and Atmospheric Administration (NOAA) was formed on October 3, 1970, by Reorganization Plan 4 of 1970. Its principal functions are authorized by title 15, chapter 9, United States Code (National Weather Service); title 33, chapter 17, United States Code (National Ocean Survey); and title 16, chapter 9, United States Code (National Marine Fisheries Service). NOAA's mission was further defined by the Coastal Zone Management Act of 1972, the Marine Mammals Protection Act of 1972, the Marine Protection, Research, and Sanctuaries Act of 1972, the Weather Modification Reporting Act of 1972, the Endangered Species Act of 1973, the Offshore Shrimp Fisheries Act of 1973, and the Fishery Conservation and Management Act of 1976. The mission of NOAA is to explore, map, and chart the global ocean and its living resources, to manage, use, and conserve those resources and to describe, monitor, and predict conditions in the atmosphere, ocean, sun, and space environment, issue warnings against impending destructive natural events, develop beneficial methods of environmental modification, and assess the consequences of inadvertent environmental modification over several scales of time.

Among its principal functions and activities, NOAA reports the weather of the United States and its possessions and provides weather forecasts to the general public, issues warnings against such destructive natural events as hurricanes, tornadoes, floods, and tsunamis and provides special services in support of aviation, marine activities, agriculture, forestry, urban air-quality control, and other weather-sensitive activities. The agency also monitors and reports all non-Federal weather modification activities conducted in the United States. Organized in 1970, NOAA assumed the functions of the environmental science programs administered by a number of Federal agencies including the Departments of Commerce, Interior, Transportation, Army, Navy, and the National Science Foundation. Its wide range of responsibilities include managing the National Weather Service and the National Marine Fisheries Service, developing environmentally sound coastal zone management programs, sponsoring atmospheric and oceanic research, overseeing and operating the nation's environmental satellite system, making extensive geodetic and oceanographic surveys, and developing data management systems. In cooperation with the Department of the Navy, several of NOAA's agencies participate in the Joint Ice Center (JIC), established to forecast and report on ice formations in the Northern Hemisphere. [27]

NATIONAL SCIENCE FOUNDATION (NSF). Established in 1950, NSF promotes the progress of science through the support of research and education. Its major emphasis is on basic research for the improved understanding of the fundamental laws of nature, and it supports these activities through grants, contracts, and other awards to universities and other research organizations. [38]

NATIONAL TIDAL DATUM CONTROL NETWORK. A network composed of the primary control tide stations of the National Ocean Service. Distributed along the coasts of the United States, this network provides the basic tidal datums for coastal boundaries and chart datums of the United States. Tidal datums obtained at secondary control tide stations and tertiary tide stations are referenced to the Network. Terrestrial leveling between stations is not a requirement of the National Tidal Datum Control Network. [1]

NATIONAL TIDAL DATUM CONVENTION OF 1980. Effective November 28, 1980, the Convention: (1) establishes one uniform, continuous tidal datum system for all tidal waters of the United States (including commonwealth, territories, and U.N. trust territory under U.S. jurisdiction) for the first time in its history; (2) provides a tidal datum system independent of computations based on type of tide; (3) lowers chart datum from mean low water to mean lower low water along the Atlantic coast of the United States; (4) updates the National Tidal Datum Epoch from 1941 through 1959, to 1960 through 1978; (5) changes the name Gulf Coast Low Water Datum to mean lower low water; (6) introduces the tidal datum of mean higher high water in areas of predominantly diurnal tides; and (7) lowers mean high water in areas of predominantly diurnal tides. [7]

NATIONAL TIDAL DATUM EPOCH. The specific 19-year period adopted by the National Ocean Service as the official time segment over which tide observations are taken and reduced to obtain mean values (e.g., mean lower low water, etc.) for tidal datums. It is necessary for standardization because of periodic and apparent secular trends in sea level. The present National Tidal Datum Epoch is 1960 through 1978. It is reviewed annually for possible revision and must be actively considered for revision every 25 years. [7]

NATURAL HARBOR. One where the configuration of the coast provides the protection necessary, for example, San Diego Bay. See Harbor. [3]

A harbor possessing natural shelter in a large degree. Natural harbors require only the provision of such facilities as quays or piers and sometimes deepening by artificial means to make them serviceable as shipping ports. [36]

NATURAL RESOURCES. Under Public Law 31 they include oil, gas, and all other minerals, and fish, shrimp, oysters, clams, crabs, lobsters, sponges, kelp, and other marine animal and plant life. Under the Convention on the Continental Shelf adopted at Geneva in 1958, they include mineral and other nonliving resources of the seabed and subsoil and the living organisms belonging to sedentary species. [3]

NATURAL SCALE. See Representative Fraction. [1]

NATURAL SHORELINE. This is the line of contact between the surface of a body of water and natural land, including islands. It does not include the water line along floating or man-made features, or along rocks smaller than those considered to be islands. [31]

NAUTICAL. Of or pertaining to ships, navigation (chiefly marine), or seamen. In contrast, Navigational refers to navigation only, Marine refers to the sea, Maritime indicates relationship or proximity to the sea, and Naval refers to the navy. [1]

NAUTICAL ALMANAC. A periodical publication of astronomical statistics useful to and designed primarily for marine navigation, particularly the American Nautical Almanac, published by the U.S. Naval Observatory. [3]

NAUTICAL CHART. A representation of a portion of the navigable waters of the earth and adjacent coastal areas on a specified map projection, and designed specifically to meet requirements of marine navigation. Included on most nautical charts are: depths of water, characteristics of the bottom, elevations of selected topographic features, general configuration and characteristics of the coast, the shoreline (usually the mean high water line), dangers, obstructions, aids to navigation, limited tidal data, and information about magnetic variation in the charted area. [1]

NAUTICAL CHART MANUAL. A manual for the cartographic engineer engaged in the construction and revision of nautical charts. Useful for establishing a charting practice as of specific time. Several such manuals have been issued by the National Ocean Service. [3]

NAUTICAL HYDROGRAPHY. That branch of science which has for its object the measurement and description of seas, lakes, rivers, and other waters with special reference to their use for navigation and commerce. It embraces marine surveying, the determination of winds, currents, and so on, as well as cartography. [36]

NAUTICAL MILE (ALSO CALLED SEA MILE AND GEOGRAPHIC MILE). A unit of distance used in marine navigation, and may be taken as equal to the length of a minute of arc along the equator or a minute of latitude on the map which is being measured. Prior to July 1, 1954, the United States nautical mile was defined as equal to 1/60 of a degree or 1/21,600 of a great circle on a sphere whose surface equals the surface of the earth. Its value calculated for the Clarke spheroid of 1866 was 1,853.248 meters, or 6,080.20 feet. On July 1, 1954, the United States adopted the international nautical mile which is 1,852.0 meters, or 6,076.10333 feet. This value was revised on July 1, 1959, to reflect the new relationship of the yard to the meter, making the new value for the international nautical mile equal to 1,852.0 meters, or 6,076.11549 international feet. [3]

A unit of distance used principally in navigation. For practical consideration it is usually considered the length of 1 minute of any great circle of the earth, the meridian being the great circle most commonly used. Because of various lengths of the nautical mile in use throughout the world, due to differences in definition and the assumed size and shape of the earth, the International Hydrographic Bureau in 1929 proposed a standard length of 1,852 meters, which is known as the International Nautical Mile. This has been adopted by nearly

all maritime nations. The U.S. Departments of Defense and Commerce adopted this value on July 1, 1954. With the yard-meter relationship then in use, the International Nautical Mile was equivalent to 6076.10333 feet, approximately. Using the yard-meter conversion factor effective July 1, 1959, (1 yard = 0.9144 meter, exactly) the International Nautical Mile is equivalent to 6076.11549 feet, approximately. See also Sea Mile. [1]

NAVIGABILITY. The actual navigable capacity of a waterway and not the extent of tidal influence. [3]

NAVIGABLE. Affording passage to a craft; capable of being navigated. [1]

NAVIGABLE AREA SURVEYS (NAS). Navigable Area Surveys are basic hydrographic surveys with restricted area coverage. The coverage is reduced by omitting requirements for: (1) development of the 0-foot depth curve and foul, nearshore areas not considered navigable; and (2) complete field edit of the survey area. Navigable Area Surveys may also be restricted to the main navigable channel or corridor. [5]

NAVIGABLE INLAND WATERS. Under federal law, those inland waters which are available for navigation in their natural condition, or which can be made available for navigation by reasonable improvements. [3]

NAVIGABLE WATERS. Waters usable, with or without improvements, as routes for commerce in the customary means of travel on water. [1]

NAVIGABLE WATERS OF A STATE. Navigable waterways that lie wholly within the limits of a state and have no navigable connection with any navigable waters outside the boundaries of the state. Such intrastate waters are subject to regulation and control by state laws and do not fall within the jurisdiction of Congress nor of the laws enacted by it for the preservation and protection of the navigable waters of the United States. [3]

NAVIGABLE WATERS OF THE UNITED STATES. Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. See 33 CFR Part 329 for a more complete definition of this term. [2]

Waters which form in their ordinary condition by themselves, or by uniting with other waters, a continued highway over which commerce is or may be carried on with other states or foreign countries in the customary modes in which such commerce is conducted by water. This applies also to an artificial canal, as long as it forms a means of communication between ports and places in different states, even though the canal is wholly within the body of a state and subject to its ownership and control. See Navigable Waters of a State. [3]

NAVIGATION. The process of planning, recording, and controlling the movement of a craft or vehicle from one place to another. The word navigate is from the Latin navigatus, the past participle of the verb navigere, which is derived from the word navis, meaning "ship," and agere, meaning "to move" or "to direct." Navigation of water craft is called marine

navigation to distinguish it form navigation of aircraft, called air navigation. Navigation of a vessel on the surface is sometimes called surface navigation to distinguish it from undersea navigation of a submerged vessel. Navigation of vehicles across land or ice is called land navigation. The expression lifeboat navigation is used to refer to navigation of lifeboats or life rafts, generally involving rather crude methods. The expression polar navigation refers to navigation in the regions near the geographical poles of the earth, where special techniques are employed. The principal divisions of navigation are as follows: dead reckoning, piloting (or pilotage), celestial navigation, and radionavigation. Inertial navigation and doppler sonar navigation are forms of dead reckoning. Satellite navigation and radar navigation are forms of radionavigation. The term electronic navigation is used to refer to navigation involving the use of electronics in any way. Thus, the term includes the use of the gyrocompass for steering and the echo sounded when piloting. Because of the wide use of electronics in navigation equipment, the term electronic navigation has limited value as a term for a division of navigation. [1]

NAVIGATIONAL AID. An instrument, device, chart, method, etc., intended to assist in the navigation of a craft. This expression should not be confused with Aids to Navigation, which refers only to devices external to a craft. In British usage, the terms navigational aid and aid to navigation are used without distinction. [1]

NAVIGATION, COASTWISE. Navigation in the vicinity of a coast, in contrast with offshore navigation. [17]

NAVIGATION, DOPPLER. (1) Navigation using the shift in frequency (Doppler shift) of sound waves reflected from the ocean bottom to determine the velocity of the vessel. (2) Navigation using the Doppler shift in frequency of radio waves reflected from the ground to determine the velocity of the aircraft. (3) Navigation using the shift in frequency of radio waves from an orbiting radio-transmitter to determine the location of the vessel or aircraft. [39]

NAVIGATION, ELECTRONIC. Navigation by means of electronic equipment. The expression electronic navigation is more inclusive than radio navigation, since it includes navigation involving any electronic device or instrument. [17]

NAVIGATION, OFFSHORE. Navigation at distance from a coast, in contrast with coastwise navigation. [17]

NAVIGATION, RADIO. Any method of navigation in which location or velocity is inferred from measurements on radio waves. The term is generally applied only to one of the following methods of navigation: (a) measuring direction or distance to two or more radio transmitters, (b) measuring differences of distance to two or more pairs of radio transmitters, (c) measuring the Doppler shift in frequency of a signal from an orbiting beacon or beacons. [39]

NAVIGATION SYSTEM. A set of equipment and techniques by which the location of a moving vehicle, vessel, or aircraft can be determined and made known sufficiently quickly so the information can be used for navigation. [39]

NAVIGATION SYSTEM, DOPPLER. In general, any navigation system which makes use of the measured shift in frequency of a signal of known frequency to determine the velocity of the receiving system relative to the signal source and from these measurements, the location of the receiver. Two different kinds of Doppler navigation systems are used at present: that in which the system itself is both source and receiver of the signal, and the velocity is with respect to the surface producing the echo; and that in which the system receives a signal from a beacon. Systems of the first kind take two forms which are very different instrumentally but share much the same mathematics. These forms are systems in which the signal consists of sound waves reflected from the ocean bottom, and those in which the signal consists of radio waves reflected from the ground. The first is used almost exclusively by ships or watercraft, the second almost exclusively by aircraft. Because neither the ocean bottom nor the ground is simple in shape nor accurately known, velocities inferred from the reflected signals are degraded by lack of complete knowledge of these shapes. Most systems of the second kind have the beacon in orbit about the Earth. The orbit of the beacon is determined by measuring the beacon's radial velocity with respect to a small number of receivers at fixed locations and solving the resulting observation equations for the parameters of the orbit. Navigating systems then use this known orbit, together with the frequency shift they measure, to determine the location of the receiver with respect to the orbit. [39]

NAVIGATION SYSTEM, HYPERBOLIC. A navigation system using the differences in distance (measured in wavelengths) of a mobile unit from three or more fixed stations to determine location. The locus of points all of which have the same difference of distance is a hyperbola. If the difference in distance from two pairs of fixed points (one point of which may be common to the two) is determined, two intersecting hyperbolas result and the mobile unit is located at one of those intersections. Only the fractional part of one wavelength is actually measured. Most hyperbolic navigation systems keep count of the changes of difference by a whole wavelength, so that once the entire distance is known, the system continues to indicate the total difference, regardless of the motion of the mobile unit. [39]

NAVIGATION SYSTEM, INERTIAL. Any navigation system in which gyroscopes or accelerometers are used to provide a coordinate system which has a fixed orientation with respect to the distant galaxies. A gyroscopic compass is a particularly simple form of inertial navigation system. A more complicated form, called SINS (Ship's Inertial Navigation System), gives not only orientation but location. It is used for ship navigation. [39]

NAVIGATION SYSTEM, SATELLITE. (1) A navigation system used for navigation of satellites. (2) A navigation system having beacons or transponders placed on satellites rather than at fixed points on land. The most successful satellite navigation system to date has been the TRANSIT system (also called NNSS or Navy Navigation Satellite System) in which the mobile unit determines its location by measuring the Doppler shift in the frequency of the radio waves from one or more satellites. The location of the satellite must, of course, be known. That information is usually available in the form of an orbit ephemeris, but is also broadcast together with the fixed-frequency radiation from the satellite.

Another system under development (1986) is the Global Positioning System (GPS), in which the mobile unit determines its location by measuring, almost simultaneously, the times of travel of signals from several satellites whose locations are known, and converting this to distances from the satellites. The plan for this system calls for eighteen satellites in orbit at

all times; at least three or four of them will be visible simultaneously from any point on earth. See also positioning system, satellite. [39]

NAVSTAR GLOBAL POSITIONING SYSTEM (GPS). A satellite navigation system being developed by the Department of Defense under Air Force management. The fully-deployed operational system is intended to provide highly accurate position and velocity information in three dimensions and precise time and time interval on a global basis continuously, to an unlimited number of authorized users. It will be unaffected by weather and will provide a worldwide common grid reference system. The objective of the program is to provide very precise positional information for a wide spectrum of military missions. In addition, current policy calls for civil availability with a degradation in system accuracy required to protect U.S. national security interests. [1]

A navigation and positioning system, under development, with which the three-dimensional geodetic position and the velocity of a user at a point on or near the Earth can be determined in real time. The system will consist of a constellation of 24 Earth-orbiting satellites which broadcast on a pair of ultrastable frequencies. The user's receiver will be able to track a minimum of four of the satellites from any location at any time, thus establishing position and velocity. [10]

NEAT LINE. Line, usually grid or graticule, bounding the detail of a map. Also referred to as inner neat line to differentiate from border drawn outside of neat line. Also written as one word. [17]

NECK. (1) A narrow isthmus, cape or promontory. (2) The land areas between streams flowing into a sound or bay. (3) A narrow strip of land which connects a peninsula with the mainland. (4) A narrow body of water between two larger bodies; a strait. [1]

NEGATIVE. A very general term, derived from photographic terminology based on camera photography and defined by most dictionaries as: "Exhibiting the reverse; showing dark for light and light for dark; as a photographic negative plate or film." There are several kinds of negatives and several ways of producing them in modern photographic-scribing-cartographic complex. A scribed sheet is essentially a manually produced negative. [28]

NEGATIVE ENGRAVING. A chart reproduction process in which the compilation manuscript, or other data, is photographed onto a plastic or glass negative. The art of creating facsimile images on a reproduction media by utilizing hand engraving techniques. [17]

NET UNDER KEEL CLEARANCE. "Net under keel clearance" means that distance between the ocean bottom and the portion of a tanker's hull closest to the ocean bottom when the tanker is underway, moored or anchored, considering ship motion in responding to the combination of actual wind, wave, tide, and current conditions. [2]

NEW AERONAUTICAL AND NAUTICAL CHARTING INVESTIGATIONS (NANCI). A procedure to supplement maintenance of Government maps and charts utilizing advanced technology methods obtained through the Eastern Mapping Center of the Geological Survey. [29]

NEW CHART. A new chart is usually constructed to satisfy the needs of navigation in a particular area; e.g., the area had no prior adequate chart coverage of the same scale, or limits are radically changed. The new chart may cancel an existing chart. [29]

NEW EDITIONS. A chart issue that cancels a previous issue. If the new information renders that existing chart obsolete, the new printing is designated a new edition. A new edition reflects one or more changes of such importance to navigation that all previous printings are obsolete. Changes may be based on corrections from the Notice to Mariners (NM) in addition to other sources. The date of a new edition is the date of the latest Defense Mapping Agency NM from which the chart has been corrected. The edition number and date are printed in the lower left corner of the chart. [29]

In British terminology, a new printing of an existing chart embodying the latest information received in the Hydrographic Department. The chart is entirely revised throughout and modernized in style, all copies of the chart in circulation being cancelled. When a new edition is published the large and small corrections dates are removed (these corrections being embodies in the new edition).

In U.S. terminology, a new printing of an existing chart embodying corrections that have become so extensive or of such importance to navigation as to render all previous printings obsolete. [17]

NINETEEN-YEAR TIDAL CYCLE. The period of time generally reckoned as constituting a full tidal cycle because the more important of the periodic tidal variations due to astronomic causes will have passed through complete cycles. The longest cycle to which the tide is subject is due to a slow change in the declination of the moon which covers 18.6 years. See Mean Low Water, Mean High Water. [3]

NOAA FORM 76-40 "NONFLOATING AIDS OR LANDMARKS FOR CHARTS". The 76-40 form was a document which provided names, positions, descriptions, and other pertinent information relating to landmarks and fixed aids to navigation. This form was forwarded to NOS charting activities and to the U.S. Coast Guard. The field editor was required to record information concerning all landmarks and fixed aids on the 76-40. Separate 76-40 forms were submitted for each of the following categories. (1) Fixed aids to navigation located within the survey area. (2) Fixed aids to navigation located outside the survey area. (3) Landmarks located within the survey area. (4) Landmarks located outside the survey area. [31]

NODE. A point common to two or more line segments, may also be the start or end point of a line, if these points are treated as being potentially common to other segments. [22]

NOMENCLATURE. The system or set of names used in a specific branch of learning or activity. [29]

NOMINAL RANGE. The maximum distance a light may be seen in clear weather (meteorological visibility of 10 n.m.) without regard to the curvature of the earth, height of eye or height of the light. Listed for all federal lighted aids except range lights and directional lights. [37]

NON-STANDARD BUOYS. The general classification of all lighted and unlighted buoys built to specifications other than modern (1962) standard designs. [1]

NON-TIDAL BASIN. An enclosed basin separated from tidal waters by a caisson or flood gates. Ships are moved into the dock near high tide. The dock is closed when the tide begins to fall. If necessary, ships are kept afloat by pumping water into the dock to maintain the desired level. Also called wet dock. [1]

NONTIDAL WATERS. Waters not subject to tidal influence. Under Public Law 31, lands beneath such waters of a state which were navigable when the state entered the Union are granted to the state. [3]

NONVOLATILE STORAGE (ISO). A storage device whose contents are not lost when power is removed. [20]

A storage medium which retains information in the absence of power and which may be made available upon restoration of power, e.g., magnetic tapes, cores, drums, and disks. (Contrasted with volatile storage.) [34]

NORMAL BASELINE. The line following the sinuosities of the low-water mark, except where indentations are encountered that fall within the category of true bays, when the baseline becomes a straight line between headlands. [3]

NORMAL POOL ELEVATION. The level at which a controlled body of water is generally maintained. [26]

NORTH. The primary reference direction relative to the earth; the direction indicated by 000° in any system other than relative. True north is the direction of the north geographical pole; magnetic north the direction north as determined by the earth's magnetic compass; grid north an arbitrary reference direction used with grid navigation. See also Cardinal Point. [1]

NOTCH. A short defile through a hill, ridge, or mountain. A deep, close pass; a defile; gap. Local in New England. [4]

NOTICE TO MARINERS. A weekly publication of the Defense Mapping Agency Hydrographic/Topographic Center prepared jointly with the National Ocean Service and the U.S. Coast Guard giving information on changes in aids to navigation (lights, buoys, daymarks, ranges), dangers to navigation (rocks, shoals, reefs, wrecks), selected items from the Local Notice to Mariners, important new soundings, changes in channels, harbor construction, radionavigation information, new and revised charts and publications, special warnings and notices, pertinent Hydrolant, Hydropac, Navarea IV and XII messages and in general, all such information as affects the mariner's charts, manuals, catalogs, sailing directions (pilots), etc. The Notice to Mariners should be used routinely for updating the latest editions of nautical charts and related publications. Notice to Mariners may be consulted at Coast Guard District Offices, Defense Mapping Agency offices and depots, naval stations, custom houses, shipping company offices, most sales agents' offices, etc. See also Great Lakes Notice to Mariners. [1]

NUMERIC. Pertaining to numerals or to representation by means of numerals. Synonymous with "numerical." See also Digital. [22]

NUMERICAL SCALE. A statement of that distance on the earth shown in one unit (usually an inch) on the chart, or vice versa. For example, "30 miles to the inch" means that 1 inch on the chart represents 30 miles on the earth's surface. See also Representative Fraction. [1]

NUN BUOY. An unlighted buoy of which the upper part of the body (above the waterline), or the larger part of the superstructure, has approximately the shape of a cone with vertex upwards. Called Conical Buoy in British terminology. [1]

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O

OBSCURED. Said of the arc of a light sector designated by its limiting bearings in which the light is not visible from seaward. [17]

OBSTRUCTION. Anything that hinders or prevents movement, particularly anything that endangers or prevents passage of a vessel or aircraft. The term is usually used to refer to an isolated danger to navigation, such as a submerged rock or pinnacle in the case of marine navigation, and a tower, tall building, mountain peak, etc., in the case of air navigation. [1]

OBSTRUCTION BUOY. A buoy used alone to indicate a dangerous reef or shoal. The buoy may be passed on either hand. [1]

OBSOLETE CHART. A chart which is not considered safe to use for navigation because it does not contain the latest important navigational information. [10]

OBSTRUCTION LIGHT. A light indicating a radio tower or other obstruction to aircraft. [1]

OBSTRUCTION MARK. A navigation mark used alone to indicate a dangerous reef or shoal. The mark may be passed on either hand. [1]

OCCASIONAL LIGHT. A light put into service only on demand. [1]

OCEAN. The great body of salt water which occupies two-thirds of the surface of the earth, or one of its major subdivisions. The sea as opposed to the land. [4]

OCEAN AND COASTAL WATERS. The navigable waters of the United States over which Corps of Engineers regulatory jurisdiction extends include all ocean and coastal waters within a zone three geographic (nautical) miles seaward from the coast line. Wider zones of three leagues (nine nautical miles) are recognized off the coast of Texas and the Gulf coast of Florida and for other special regulatory powers such as those exercised over the outer continental shelf. [2]

OCEAN NOMENCLATURE. The generic names assigned to the water areas of the world. Except for the oceans, there are no exact criteria for defining the secondary features. What is called a "gulf" in one locality may be termed a "sea" in another. In many cases, the nomenclature represents long, historic usage which has not been deemed advisable to disturb. [3]

OCEAN WATERS. (a) The term "ocean waters" means those waters of the open seas lying seaward of the base line from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606: TIAS 5639). [2]

For application to the provisions of the Marine Protection, Research, and Sanctuaries Act of 1972, those waters of the open seas lying seaward of the base line from which the territorial sea is measured. [1]

OCS FACILITY. "OCS facility" means any artificial island, installation, or other device permanently or temporarily attached to the subsoil or seabed of the Outer Continental Shelf, erected for the purpose of exploring for, developing, or producing resources therefrom, or any such installation or other device (other than a ship or vessel) for the purpose of transporting such resources. The term includes mobile offshore drilling units when in contact with the seabed of the OCS for exploration or exploitation of subsea resources. The term does not include any pipeline or deepwater port (as the term "deepwater port" is defined in section 3(10) of the Deepwater Port Act of 1974 (33 U.S.C. 1502)). [2]

OFFICER IN CHARGE. "Officer in Charge, Marine Inspection" means a person who commends a Marine Inspection Zone described in Part 3 of this chapter and who is immediately responsible for the performance of duties with respect to inspections, enforcement, and administration of regulations governing units. [2]

OFFLINE (ISO). Pertaining to the operation of a functional unit when not under the direct control of the computer. [20]

Descriptive of a system and of the peripheral equipment or devices in a system in which the operation of peripheral equipment is not under the control of the central processing unit. (Clarified by off-line equipment.) [34]

OFFSET LITHOGRAPHY. An indirect method of printing whereby the ink image is transferred from the pressplate to an intermediate surface of a rubber blanket, and from that to the paper or other stock. Also called offset; offset printing. [10]

OFFSET PRINTING. Printing produced on an offset press from a planographic plate using a balance of water and ink to keep the image ink-receptive and the non-image area ink-repellent. [33]

OFFSHORE. Away from the shore. The comparatively flat zone of variable width which extends from the outer margin of the rather steeply sloping shoreface to the edge of the continental shelf. [17]

OFFSHORE LIGHT STATIONS. Manned light stations built on exposed marine sites to replace lightships. [1]

OFFSHORE NAVIGATION. Navigation at a distance from a coast, in contrast with coastwise navigation in the vicinity of a coast. [1]

OFFSHORE TOWER. Manned or monitored light stations built on exposed marine sites to replace light vessels. [37]

OFFSHORE WATER. See Ocean Waters. Water adjacent to land in which the physical properties are slightly influenced by continental conditions. [1]

OFF SOUNDINGS. Said of a vessel navigating beyond the 100-fathom curve. In earlier times, said of a vessel in water deeper than could be sounded with the sounding lead. [1]

OFF STATION. A floating aid not on its assigned position. [37]

OIL AND GAS LEASE. An area not to exceed five thousand seven hundred and sixty acres of submerged land of the outer continental shelf granted by the Secretary of Interior to the highest responsible qualified bidder by competitive bidding under regulations promulgated in advance for the purpose of exploration and development of oil and gas deposits. Leasing maps and official protraction diagrams are prepared by the Minerals Management Service. [29]

OMEGA NAVIGATION SYSTEM. A worldwide, continuous, radionavigation system of medium accuracy which provides hyperbolic lines of position through phase comparisons of VLF (10-14kHz) continuous wave signals transmitted on a common frequency on a time-shared basis. The fully implemented system is comprised of only eight transmitting stations. [1]

OMNIRANGE. A radio Aid to Navigation providing direct indication of the magnetic bearing (omnibearing) of that station from any direction. Also called omnidirectional range or omnidirectional beacon. [17]

ONE-WAY TRAFFIC LANE. A lane within which all ships are advised to proceed in approximately the same direction. [17]

ONLINE. (1) (ISO) Pertaining to the operation of a functional unit when under the direct control of the computer. (2) Pertaining to a user's ability to interact with a computer. (3) Pertaining to the user's access to a computer via a terminal. [20]

Descriptive of a system and peripheral equipment or devices in a system in which the operation of such equipment is under control of the central processing unit. Information reflecting current activity is introduced into the data processing system as soon as it occurs. It is directly in line with the main flow of the transaction processing. (Clarified by on-line equipment, and synonymous with in-line processing and on-line processing.) [34]

ON SOUNDINGS. Said of a vessel navigating within the 100-fathom curve. In earlier times, said of a vessel in water sufficiently shallow for sounding by sounding lead. [1]

OPAQUE. Not transmitting light. Also, not transmitting the particular wave lengths (which may or may not be visible) which affect given photosensitive materials. Thus, a substance may be opaque to some colors and not to others. It may be visually transparent, yet actinically opaque. Also, a material applied to areas of a sheet to make it opaque in those areas. Also, to apply such a material. [28]

OPEN COAST. The coast that fringes the marginal sea as distinguished from the coast that fringes inland waters. [3]

A coast that is not sheltered from the sea. [17]

OPEN HARBOR. An unsheltered harbor exposed to the sea. [1]

OPEN SEA. The water area of the open coast seaward of the ordinary low-water mark, or seaward

of inland water. [3]

OPEN WINDOW PROCESS (CARTOGRAPHY). A method of preparing color separation negatives or positives by peeling an opaque stratum from its base in the desired areas. It is normally used for preparing large areas covered by vegetation or open water. See also Mask, definition 2. [10]

OPERATOR. "Operator" means (1) in the case of a vessel, a charterer by demise or any other person who is responsible for the operation, manning, victualing, and supplying of the vessel; or (2) In the case of an OCS facility, the operator as defined in 30 CFR 250.2(gg). [2]

OPTICAL SCANNER. (1) (ISO) A scanner that uses light for examining patterns. (2) A device that scans optically and usually generates an analog or digital signal. [20]

A special optical device which scans patterns of incident light and generates analog/digital signals which are functions of the incident light synchronized with the scan, the primary purpose being to generate or "read" digital representations of printed or written data. [34]

ORDINARY HIGH WATER MARK. The "ordinary high water mark" on non-tidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas. [2]

ORIGIN. The absolute storage address in relative coding to which addresses in a region are referenced. [24]

ORIGIN OF COORDINATES. A point in a system of coordinates which serves as an initial point in computing its elements or in prescribing its use. The term origin of coordinates has several definitions, each so well established that a single definition cannot be prescribed to the exclusion of others. However, the following are given in the order of preferred use; to avoid misunderstanding, the use should be defined by stating the position of the origin in the system and giving the numerical coordinates assigned it. (1) The origin of coordinates is the point of intersection of the coordinate axes, from which the coordinates are reckoned. In mathematical treatises this origin is usually given the coordinates (0,0); in surveying, however, it is standard practice to give this origin coordinates having large positive numerical values, thereby avoiding the use of negative coordinates. See also state coordinate systems. (2) The origin of coordinates is the point to which the coordinate values (0,0) are assigned, irrespective of its position with reference to the axes. (3) The origin of coordinates is the point from which the computation of the elements of the coordinate system (projection) proceeds. [10]

ORTHOPHOTOGRAPH. A photographic copy, prepared from a perspective photograph, in which the displacements of images due to tilt and relief have been removed. [17]

ORTHOPHOTOMAP. A map made by assembling a number of orthophotographs into a single, composite picture. A grid is usually added. It may be further improved, cartographically, by photographically bringing edges out sharply in the picture, or by adding color or symbols. [39]

ORTHOPHOTOQUAD. An orthophotograph or mosaic of orthophotographs at the size of a standard quadrangle (a scale of 1:24,000), with little or no cartographic work added to it. (USGS). [39]

OUTER CONTINENTAL SHELF (OCS). Means all submerged lands lying seaward and outside of the area of "lands beneath navigable waters" as defined in section 2(a) of the Submerged Lands Act (43 U.S.C. 1301(a)) and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control.

"OCS activity" means any offshore activity associated with exploration for, or development or production of, the minerals of the Outer Continental Shelf. [2]

Under Public Law 212 (the Outer Continental Shelf Lands Act) it is that portion of the continental shelf which lies seaward of state boundaries as defined in Public Law 31 (the Submerged Lands Act). [3]

OUTER CONTINENTAL SHELF LANDS ACT. See Public Law 212. [3]

OUTLET. The opening by or through which any body of water discharges its content. [4]

OUTPUT. (1) The information transferred from the internal storage of a computer to secondary or external storage, or to any device outside of the computer; (2) the routines which direct 1; (3) the device or collective set of devices necessary for 1; (4) to transfer from internal storage on to external media. [24]

Pertaining to a device or process involved in the delivery of data by a computer, data processing or recording system. Also short for "output data," the data being delivered by the system. [22]

OVERFALLS. Short, breaking waves occurring when a strong current passes over a shoal or other submarine obstruction or meets a contrary current or wind. See Rips. [17]

OVERLAY. A printing or drawing on a transparent or semitransparent medium at the same scale as a map, chart, etc., to show details not appearing, or requiring special emphasis, on the original. (lithography) Additional data, or a pattern, printed after the other features so as to "overlay" them. See also correction overlay; history overlay; radarscope overlays, selection overlay. [10]

(a) A sheet containing explanatory or modifying data, placed over and keyed to existing or basic copy. (b) Additional data, or a pattern, printed after the other features, so as to "overlay" them. [28]

OVERPRINT. Information printed or stamped upon a map or chart, in addition to that originally printed, to show data of importance or special use. Also called surprint. A feature of a composite map image incidentally printed so as to interfere with another feature. [10]

In cartography, an additional plate, generally in a distinctive colour, printed down on a map or chart which is already complete in itself. Overprints may be used to reproduce specialized information (e.g., to add aeronautical information to a topographic map) or to incorporate

revision data without the amendment of existing plates. [17]

An image intentionally printed over or "on top of" another image to supply additional information or modify the basic image. Also to make such a print. (b) A feature of a composite map image accidentally printed so as to interfere with another feature. [28]

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P

PALISADE. A picturesque, extended rock cliff rising steeply from the margin of a stream or lake; a line of bold cliffs, especially one showing basaltic columns. (Usually pl.) [4]

PANTOGRAPH. An instrument which makes use of the properties of a parallelogram, for the mechanical copying of drawings at a predetermined reduced (or enlarged) scale. [21]

PARALLEL, GEOGRAPHIC. A line on the earth or a representation thereof, which represents the same latitude at every point. The term is applicable alike to an astronomic or a geodetic parallel. Also called a parallel of latitude or, when no misunderstanding is possible, a parallel. [39]

PARALLEL, STANDARD. A parallel of latitude which is used as a control in the computation of a map projection. For a tangent cone, this is the parallel of tangency. For a secant cone, the two parallels of intersection are the standards. [17]

PARALLELS. Imaginary planes passing through the earth parallel to the equator and measure latitudes north or south of the equator. [3]

A circle (or approximation of a circle) on the surface of the earth, parallel to the equator and connecting points of equal latitude. Also called parallel of latitude. [17]

PARAMETER. (1) (ISO) A variable that is given a constant value for a specified application and that may denote the application. (2) See external program parameter, preset parameter, program-generated parameter. [20]

(1) In a subroutine, a quantity which may be given different values when the subroutine is used in different main routines or in different parts of one main routine, but which usually remains unchanged throughout any one such use. (2) A quantity, in a mathematical calculation, that may be assigned any arbitrary value. (3) In generators, the quantity used to designate input/output devices to specify subroutines to be included, or to define the routine to be generated. (5) A constant or a variable in mathematics that remains constant during some calculation. (6) A definable characteristic of an item, device, or system. [34]

A variable that is given a constant value for a specific purpose or process. [22]

PARITY CHECK. A check that tests whether the number of ones (or zeros) in an array of binary digits is odd or even. Synonymous with odd-even check. [9]

PASS. (1) A navigable channel leading to a harbor or river. Sometimes called passage. (2) A break in a mountain range, permitting easier passage from one side of the range to the other; also called Col. (3) A narrow opening through a barrier reef, atoll, or sand bar. [1]

A gap, defile, or other relatively low break in a mountain range through which a road or trail may pass; an opening in a ridge forming a passageway. A narrow, connecting channel between two bodies of water. [4]

PASSAGE. A narrow navigable channel, especially one through reefs or islands. Sometimes called a pass, or in New England waters a hole. [17]

PASSING LIGHT. A term applied to a lower candlepower light mounted on a light structure. Used where a mariner passes out of the main light beam (such as a range light) but still needs to keep the structure in sight during transit. [4]

PEAK. A pointed mountain summit; the topmost point; summit; a seamount rising more than 500 fathoms from the sea floor and having a pointed or rounded top. [4]

PECKED LINE. In cartography, a symbol consisting of a line broken at regular intervals. [17]

PEEL (NEGATIVE ENGRAVING). A technique of removing the opaque stratum from its supporting base. Peeling between etched outline images produced a negative; peeling outside of the etched outline images produces a positive. [10]

PEELCOAT. Stable base plastic coated with a light-blocking coating which can be peeled away to a cut line, thus forming a negative or a positive. A non-photographic or other line image may be exposed onto a photo-sensitive emulsion placed over the coating for hand cutting or engraving the peeling limit. The coating may be a photo-sensitive emulsion, in which case the peeling limit line is produced by contact to a line drawing, the unexposed, unhardened, water soluble line being washed out producing the equivalent of a cut line limit for peeling away the "hardened" exposed emulsion. Peelcoats are used in the process of filling areas with color by means of lithographic screening. [29]

PENINSULA. A body of land jutting into and nearly surrounded by water, frequently (but not necessarily) connected to a larger body of land by a neck or isthmus. [4]

PERCH. A staff placed on top of a buoy, rock, or shoal as a mark for navigators. A ball or cage is sometimes placed at the top of the perch, as an identifying mark. [17]

PERIOD. The interval of time between the commencement of the identical aspect in two successive cycles of a rhythmic light. [37]

PERIPHERAL EQUIPMENT. In a data processing system, any unit of equipment, distinct from the central processing unit, which may provide the system with outside communication. [9]

PERMAFROST. A layer of soil or bedrock at a variable depth beneath the surface of the earth in which the temperature has been below freezing continuously from a few to several thousands of years. Permafrost exists where the summer heating fails to descend to the base of the layer of frozen ground. [17]

Permanently frozen subsoil. Any soil or other deposit, including rock, the temperature of which has been below freezing continuously for 2 years or more is considered permafrost. [1]

PHOTOGRAMMETRIC COMPILATION. Photogrammetric compilation is the production of a map or chart, or portion thereof, from aerial photographs and geodetic control data. When

compilation involves stereo instruments, this is called stereocompilation. [31]

PHOTOGRAMMETRIC SURVEY. In Coast Survey usage, a survey of a portion of the land surface utilizing aerial photographs and reduced to map form by steroscopic or other instrumental equipment. See Topographic Survey. [3]

PHOTOGRAMMETRY. (1) The science or art of obtaining reliable measurements from photographic images. (2) The science of preparing charts and maps from aerial photographs using steroscopic equipment and methods. [1]

PHOTOGRAPHIC COMBINATION/PHOTOMECHANICAL COMBINATION. Production of a combined image from two or more originals in exact Register. [21]

PHOTOLITHOGRAPHY. That branch of lithographic printing in which photography is employed for production of the image on the final printing surface. The original printing surface, lithographic stone, has been almost completely displaced by thin and flexible sheets of metal (zinc, aluminum, stainless steel, bimetallic plates, polymetallic plates). [17]

A reproduction process that made possible the use of colors for emphasizing important navigational features on nautical charts - the coloring of buoys to correspond to their colors in the water, the accentuation of lighted aids to navigation by using a color overprint, and the use of tints for the land and the shoal-water areas. [3]

PHOTOMAP. An assemblage of aerial photographs that, wholly or partially, substitutes for or supplements a map.

The photographs may or may not be rectified or restituted. A grid, marginal information, contours, place names, boundaries, and other data may be added. [39]

PHOTOMECHANICAL PROCESS. Any method or process (not involving a lens system) which makes use of light-sensitive materials for reproduction by contact. [21]

PHOTOMOSAIC. (1) An assemblage of photographs, each of which shows part of a region, put together in such a way that each point in the region appears once and only once in the assemblage, and scale variation is minimized. A photomosaic is assembled by trimming, warping, and fitting together the individual photographs. If the photographs were taken at different heights, the individual photographs must be enlarged or reduced to a common scale. (2) An assemblage of parts of aerial photographs joined together to leave as few variations of scale as possible.

It may be uncontrolled or may be controlled by adjusting distortions to ground measurements. See mosaic, controlled; mosaic, map controlled; and mosaic, semicontrolled. [39]

PHOTON. The automated photo-mechanical type-producing system used in the National Ocean Service for producing virtually all of the high-quality type used on nautical and aeronautical charts and other products. Called the Photon Pacesetter Mark IV, it uses a self-contained programmable computer with a 16K memory driven by an on-line keyboard to disc, or by tape. A glass disc matrix of 16 type faces, 112 characters/face, for a total of 1792 characters,

spins at 30 rps with the desired character exposed onto a film positive at the precise instant by a strobe light. The sixteen available letter sizes range from 5 to 48 points (approx. .070" to .67") [29]

PHOTOPRINT. The product of any of several photomechanical processes or methods used to obtain a positive or negative facsimile. The photoprints obtained are usually referred to by names indicating the process used, the appearance of the print, or a familiar trade name of a process. [28]

PHOTOTRIANGULATION. (1) The determination of horizontal or vertical coordinates from measurements of angle, distance, or coordinates of points on overlapping photographs. Phototriangulation is classified as terrestrial or aerial, depending on whether the photographs were taken on the ground or from the air. Aerial phototriangulation is commonly called "aerotriangulation." (2) The method by which horizontal or vertical control is determined from measurements of angle, direction, or coordinates of points or overlapping photographs. [39]

The process for the extension of horizontal and/or vertical control whereby the measurements of angles and/or distances on overlapping photographs are related into a spatial solution using the perspective principles of the photographs. Generally, this process involves using aerial photographs, and is called aerotriangulation, aerial triangulation, or photogrammetric extension. [17]

PICA. The standard for measuring type - approximately 1/6 of an inch. [33]

PICTORIAL SYMBOL. A symbol whose form is a simplified portrayal of the feature or phenomenon it represents. [21]

PIER. (1) A structure extending into the water approximately perpendicular to a shore or a bank and providing berthing for ships, and which may also provide cargo-handling facilities. See also wharf. (2) A structure extending into the water approximately perpendicular to a shore or bank and providing a promenade or place for other use, as a fishing pier. (3) A support for the spans of a bridge. [1]

A structure, usually of open construction, extending out into the water from the shore, to serve as a landing place, a recreational facility, etc., rather than to afford coastal protection. In the Great Lakes, a term sometimes improperly applied to jetties. [14]

PIERHEAD. That part of a pier or jetty projecting farthest into the water. [1]

PILE. A long, heavy timber or section of steel, concrete, etc., forced into the earth to serve as a support, as for a pier, or to resist lateral pressure. [1]

PILE, SHEET. A pile with a generally slender flat cross section to be driven into the ground or seabed and meshed or interlocked with like members to form a diaphragm, wall, or bulkhead. [14]

PILING. A group of piles set in a row. [4]

PILLAR BUOY. A buoy composed of a tall central structure mounted on a broad flat base. Also

called beacon buoy. [1]

PILOT. One who directs the movements of a vessel through pilot waters; usually, one who has demonstrated extensive knowledge of channels, aids to navigation, dangers to navigation, etc., in a particular area and is licensed for that area. [3]

PILOT AREA. A pilot area represents a meeting or boarding place where vessels pick up or disembark pilots. A pilot vessel may either cruise in the area continuously or come out on request. [29]

PILOT STATION. The office or headquarters of pilots; the place where the services of a pilot may be obtained. [1]

PINHOLES. Tiny clear spots on negative images caused by dust, air bubbles, or undissolved chemicals. [10]

PINNACLE. On the sea floor, a high tower or spire-shaped pillar of rock or coral, along or cresting a summit. It may or may not be a hazard to surface navigation. Due to the sheer rise from the sea floor no warning is given by sounding. [1]

PIPE. A hollow metal tube, of varying diameters and lengths, imbedded in the bottom in a manner similar to a pile. Pipes are often used as privately maintained aids to navigation and in the determination of beach or bottom sand migration (deposition or erosion). [40]

PLAIN. A region of uniform general slope, comparatively level, of considerable extent, and not broken by marked elevations and depressions (it may be an extensive valley floor or a plateau summit); an extent of level or nearly level land; a flat, gently sloping or nearly level region of the sea floor. [4]

PLANE RECTANGULAR COORDINATES. A system of coordinates in a horizontal plane, used to describe the positions of points with respect to an arbitrary origin. The origin is established by a pair of axes which intersect at right angles. The position of a point is determined by the perpendicular distances to these axes. Also called plane coordinates. [10]

PLANETABLE. A field device for plotting the lines of a survey directly from observations. It consists essentially of a drawing board mounted on a tripod, with a leveling device designed as part of the board and tripod. [10]

PLANIMETRIC MAP. A map indicating only the horizontal positions of features, without regard to elevation, in contrast with a topographic map, which indicates both horizontal and vertical positions. [1]

PLANOGRAPHIC. Where the image to be printed is on the same plane (level) as the non-image areas. Inking rollers touch both image and non-image areas. The image areas are ink-receptive and the non-image areas are ink-repellent, Planographic image-carriers are commonly used in offset printing. [33]

PLAN POSITION INDICATOR (PPI). A cathode ray scope on which signals appear in correct

relation to each other, so that the scope face presents a maplike representation of the area about the transmitter, the direction of a target being represented by the direction of its echo from a centre and range by its distance from that centre.

PLAT (U.S. terminology). A diagram drawn to scale showing land boundaries and subdivisions, together with all data essential to the description and identification of the several units shown thereon, and including one or more certificates indicating due approval. A plat differs from a map in that it does not necessarily show additional cultural, drainage and relief features. See also Cadastal Mapping. [17]

PLATE. (1) (lithography) A thin metal, plastic, or paper sheet, that carries the printing image and whose surface is treated to make only the image areas ink-receptive. Also call pressplate. (2) Photography) A transparent medium, usually glass, coated with a photographic emulsion. [10]

(1) A printing plate of zinc, aluminum or (arch) engraved copper. (2) A drawing base carrying the information to be shown on a map. (3) All detail to appear on a map which will be reproduced form a single printing plate; ex: the "blue plate" or the "contour plate." [21]

PLATEAU. An elevated plain, tableland, or flat-topped region of considerable extent; a comparatively flat-topped elevation of the sea floor greater than 60 nautical miles across the summit and normally rising more than 100 fathoms on all sides. [4]

PLATFORM. In geographical literature, a natural or artificial terrace; a flat elevated piece of ground; a tableland, a plateau. In oceanographic terminology, any man-made structure (aircraft, ship, buoy, or tower) from or on which oceanographic instruments are suspended or installed. [17]

Structures which are erected on or over the seabed and subsoil of the Outer Continental Shelf and in the waters under the jurisdiction of the United States, for the purpose of exploring for, developing, removing and transporting resources there from. This shall include all fixed structures, temporary or permanent, for which a Corps of Engineers' permit is issued. It shall include, but is not necessarily limited to, all drilling platforms, production platforms, quarters platforms, pipe line riser platforms, manifold platforms, loading platforms, boat landings, caissons, well protective structures, tank battery barges submerged on station, drilling barges submerged on location, breakwater barges submerged on location, and all other piles, pile clusters, pipes, or structures erected in the waters. [2]

PLOT. (1) A map, chart, or graph representing data of any sort. (2) To represent on a diagram or chart the position or course of a target in terms of angles and distances from known positions; locate a position on a map or chart. (3) The visual display of a single geographical location of an airborne object at a particular instant of time. (4) A portion of a map or overlay on which are drawn the outlines of the areas covered by one or more photographs. [10]

(1) To generate graphic images according to given coordinate values describing the geometry of the image. (2) To use a plotter. The graphic resulting from (1). [22]

PLOTTER. (1) (ISO) An output unit that presents data in the form of a two-dimensional graphic representation. (2) See drum plotter, flatbed plotter. [20]

(1) A visual display or board in which a dependent variable is graphed by an automatically controlled pen or pencil as a function of one or more variables. (2) A device that inscribes a visual display of a dependent variable. [34]

A device capable of generating permanent graphic images on some sort of removable medium, like paper or film, from digital or analog input signals (see also "digital plotter" and analog plotter"). These signals are in turn generated by a controller (special hardware or a computer with specific software) from digital data, mainly coordinate values describing the geometry of the image. If the image is not removable but just displayed for a limited amount of time (like on the face of a CRT), the device is called a graphic display. [22]

PLOT FILE. A file containing the necessary data for the generation of a graphic by specific programs and on a particular plotter, i.e., a particular sort of a graphics file. [22]

PLOTTING HEAD (ISO). That part of a plotter used to create marks on a display surface. [20]

PLOTTING SHEET. A blank chart, usually on the Mercator projection, showing only the graticule and a compass rose, so that the plotting sheet can be used for any longitude. In hydrographic surveying, a working sheet on which the main stations of the survey are plotted. It forms the framework of the survey and provides the basis for accurately locating and plotting all the detail of the survey. See also Lattice. [17]

PLUGBOARD (ISO). A perforated board into which plugs or pins may be placed to control the operation of equipment. Synonymous with control panel, pinboard. [20]

POCOSIN. A swamp; a dismal. (Southern U.S.) [4]

POINT. The extreme end of a cape, or the outer end of any land area protruding into the water (less prominent than a cape). [4]

(1) A place having position, but no extent. A point in motion produces a line; a straight line in motion in any direction except along itself produces a surface; a plane surface in motion in any direction except along itself produces a solid. (2) A tapering piece of land projecting into a body of water. It is generally less prominent than a cape. [3] One thirty-second of a circle, or 11¼°. A cardinal point is any of the four principal directions; north, east, south or west; an intercardinal point is any of the four directions midway between the cardinal points; northeast, southeast, southwest, or northwest. Also called compass point when used in reference to compass directions. [1]

One of the thirty-two divisions of the compass card. There are in each point 11° 15'. The point is subdivided into half points, each of 5° 37' 30", and quarter points, each of 2° 48' 45". Midway between each cardinal and intercardinal point is a point with a name formed by combining that of the cardinal and intercardinal point, the former being placed first; as for example north-northeast, east-northeast, and so forth. Midway between the points already indicated are points bearing the name of the nearest cardinal or intercardinal point followed by the word "by" and the name of the cardinal point in the direction in which it lies, as for

instance north by east, northeast by north, and so on. [36]

A unit of type measurement 0.0138 of an inch, 12 points to the pica, 72 to the inch. [33]

POINT MODE (DIGITIZING). Digitizing mode where the position of the cursor is recorded only when the operator presses a button or foot-switch. Contrast with "dynamic mode" (or "stream mode"). [22]

POINT SYMBOL. A symbol employed to indicate that a particular phenomenon occurs at, or a particular value may be attributed to, a specific point on a map. [21]

POLYCONIC MAP PROJECTION. A map projection having the central geographic meridian represented by a straight line, along which the spacing for lines representing the geographic parallels is proportional to the distances between the parallels; the parallels are represented by arcs of circles which are not concentric, but whose centers lie on the line representing the central meridian, and whose radii are determined by the lengths of the elements of cones which are tangent along the parallels. All meridians except the central ones are curved. The projection is neither conformal nor equal area, but it has been widely used for maps of small areas because of the ease with which it can be constructed. [10]

POND. A small body of still water of artificial formation, its bed being either hollowed out of the soil or formed by embanking and damming up a natural hollow. [17]

A small fresh-water lake. [4]

PONTOON. A flat bottomed boat or a number of flat bottomed boats or other floating objects, such as hollow cylinders, used as supports for a bridge.

PONTOON BRIDGE. A bridge supported on pontoons.

POOL. A water hole or small pond; a small body of standing water; a small and rather deep body of (usually) fresh water, as one in a stream. [4]

PORT. A place for the loading and unloading of vessels recognized and supervised for maritime purposes by the public authorities. The term includes a city or borough for the reception of mariners and merchants and therefore denotes something more than a harbor or havre. A port may possess a harbor but a harbor is not necessarily a port. Any natural creek or inlet on the sea shore with adequate depth of water and sufficient shelter for ships fulfills the essential conditions of a harbor. To make it a port, in the accepted sense of the word, there must be in addition accommodation and facilities for landing passengers and goods and some amount of overseas trade. [36]

(1) A place provided with terminal and transfer facilities for loading and discharging cargo or passengers, usually located in a harbor. (2) The left side of a craft, facing forward. The opposite is starboard. [1]

PORT HAND BUOY. A buoy which is to be left to the port hand when approaching from the open sea or in general proceeding in the direction of the main stream of flood current, or in the direction established by appropriate authority. [1]

PORT SERIES. A series of reports published jointly by the Corps of Engineers, U.S. Army, and the Maritime Administration, U.S. Department of Transportation; the reports describe in detail the facilities and services available to shipping at selected U.S. seaports. [15]

POSITION. A point defined by stated or implied coordinates, particularly one on the surface of the earth. A fix is a relatively accurate position determined without reference to any former position. A running fix is a position determined by crossing lines of position obtained at different times and advanced or retired to a common time. An estimated position is determined from incomplete data or data of questionable accuracy. A dead reckoning position is determined by advancing a previous position for courses and distances. A most probable position is that position of a craft judged to be most accurate when an element of doubt exists as to the true position. It may be a fix, running fix, estimated position, or dead reckoning position depending upon the information upon which it is based. An assumed position is a point at which a craft is assumed to be located. A geographical position is that point on the earth at which a given celestial body is in the zenith at a specified time, or any position defined by means of its geographical coordinates. A geodetic position is a point on the earth the coordinates of which have been determined by triangulation from an accurately known initial station, or one defined in terms of geodetic latitude and longitude. An astronomical position is a point on the earth whose coordinates have been determined as a result of observation of celestial bodies, or one defined in terms of astronomical latitude and longitude. A maritime position is the location of a seaport or other point along a coast. A relative position is one defined with reference to another position, either fixed or moving. [1]

POSITION ADJUSTED. An adjusted value of the coordinate position of a point on the earth. In the adjustment of a horizontal control survey, discrepancies arising from errors in the observational data are removed, and position data of the survey stations are correlated and coordinated on an adopted reference system (geodetic datum or plane-coordinate system). The positions which are obtained by the adjustment are called adjusted positions, and when used as control for other work are referred to as fixed positions. [8]

POSITIONAL NOTATION. A numeration system in which a number is represented by means of an ordered set of digits, such that the value contributed by each digit depends upon its position as well as upon its value. Synonymous with positional representation. [9]

POSITION APPROXIMATE. Of inexact position. The expression is used principally on charts to indicate that the position of a wreck, shoal, etc., has not been accurately determined or does not remain fixed. Usually shown by the abbreviation 'P.A.'. [17]

POSITION, DETACHED. In hydrographic survey, an expression indicating a position taken, to locate rocks, floating aids to navigation, least depths on shoals or other dangers or features of importance. [17]

POSITION DOUBTFUL. Of uncertain position. The expression is used principally on charts to indicate that a wreck, shoal, etc., has been reported in various positions and not definitely determined in any. Usually shown by the abbreviation 'P.D.'. [17]

POSITION, ESTIMATED. The most probable position of a craft determined from incomplete data or data of questionable accuracy. Such a position might be determined by applying a correction to the dead reckoning position. [17]

POSITION, FIELD. A position computed while field work is in progress to determine the acceptability of the observations or to provide a preliminary position for the purposes. [17]

POSITION, GEODETIC. A point on the earth, the coordinates of which have been determined by triangulation from an initial station whose location has been established as a result of astronomical observations. The coordinates of such a position depend upon the reference spheroid used.

A point on the earth, defined in terms of geodetic latitude and longitude. [17]

POSITION, GEOGRAPHIC. The position of a point on the surface of the earth expressed in terms of latitude and longitude, either geodetic or astronomic.

The National Ocean Service uses the term geographic positions for positions on a geodetic datum. [8]

POSITIONING SYSTEM, DOPPLER. A positioning system consisting of a radio receiver at the point whose coordinates are to be determined, one or more beacons in orbit about the Earth, and a computing system for determining the orbits of the beacons. The difference between the frequency of a radio wave as received and its frequency as transmitted from the beacon is a function of the radial velocity of the source with respect to the receiver. Given the ephemeris of the beacon, the coordinates of the receiver can be calculated from measurements of the difference in frequency. [39]

POSITIONING SYSTEM, HYPERBOLIC. A positioning system in which the observer measures the difference in time of reception of signals from two stations whose coordinates are known. The difference in time is converted to a difference in distance. The locus of all points lying at a fixed difference in distance from two points are the two branches of a hyperbola. There is usually a third station operating in conjunction with one of the other two to provide the observer with another difference in distance and another pair of hyperbola branches. The observer is at one of the intersections of the branches. [39]

POSITIONING SYSTEM, INERTIAL. A positioning system consisting of a computer and an assemblage of three accelerometers and two or three gyroscopes. The gyroscopes are fastened together in such a way that they define the orientation of the accelerometers with respect to nonrotating coordinates and the accelerometers measure the components of acceleration of the positioning system along the directions defined by the gyroscopes. The computer and associated equipment integrate the components of acceleration to give the three components of displacement of the positioning system. [39]

POSITIONING SYSTEM, RADIO. A positioning system in which the travel time or phase shift of radio waves is measured. The most common radio positioning systems at present measure the difference in time of travel of radio pulses from three or more known points. [39]

POSITIONING SYSTEM, SATELLITE. A positioning system consisting of a radio-receiver, or a receiver and transmitter, at the point whose location is to be determined, one or more beacons or transponders in orbit about the Earth, and a computing system for determining and predicting the orbits. The satellites can be considered points of known location. The radio receiver may measure times of travel of radio pulses, directions to the satellites or the Doppler shift in the frequency of the radio waves emitted by the satellites. See Navigation System, Satellite. [39]

POSITIVE. A document in which linework or Detail is in a darker color than the background (or is opaque) and which is right reading when viewed from the image or emulsion side. A reversal positive is a similar document which is laterally reversed when viewed from the emulsion side. [21]

A photographic image, usually made from a negative, in which tones are not reversed as in a negative. Positive on paper is usually called "print", and one on a transparent base, such as film, is called a "positive transparency". [28]

POST. A small beacon, more substantial than a perch, used for marking channels. See also Pile. [17]

POTABLE WATER. Water suitable for drinking or cooking, from both health and aesthetics considerations. [23]

POTABLE WATER INTAKE (PWI). A structure designed for the intake of drinking water. The intake is usually elevated above the bottom, supported and protected by a debris-screening structure (crib), a separately charted feature. [29]

POUND NET. A set net composed of vertical netting supported and held in place by stakes. It consists of three essential parts. The pot (pound, pocket, bowl), the wings or hearts and the leader or lead. The pound consists of a bag of stout netting with 1 inch meshes the margin of which is supported by upright stakes. The bottom of the pound is spread and secured by ropes which pass through loops near the lower end of the stakes. The wings or heart are vertical fences of netting diverging from the entrance of the net. The mesh is 1/2 inch and they are supported by stakes. The leader, which may vary in length from about 150 feet to 1,000 or more, extends from shore or shallow water into deeper water and deflects the fish towards the heart or wings. [36]

PRAIRIE. A treeless and grassy plain; an extensive tract of grassland; a low, sandy, grassy tract in the Florida pine woods. [4]

PRATIQUE. Permission granted by the quarantine authorities (U.S. Public Health Service) to a vessel, which has arrived from a foreign port, to communicate with the shore; pratique is normally granted only after inspection and release. Pratique may be granted by radio without inspection to some of the larger passenger vessels entering certain specified U.S. ports; a request for such radio pratique must be made by radio, giving all particulars regarding sanitary conditions aboard, from 12 to 24 hours before the time of arrival at the port. [15]

PRECAUTIONARY AREA. A routeing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended. [19]

PRECIPICE. The brink or edge of a high and very steep cliff; an abrupt declivity. [4]

PRE-INPUT EDITING. Revision of graphics and editorial preparation of graphics to be digitized before input of data (e.g. before being digitized.) [22]

PRELIMINARY. Not of the desired accuracy and precision, and adopted for temporary use with the provision of later being superseded. In the adjustment of triangulation, the term preliminary is applied to triangles and geographic positions derived from selected observations for use in forming latitude and longitude condition equations. [8]

PRELIMINARY CHART. A chart for which there is a strong requirement, but of a region where some or all of the survey data does not meet modern standards. The deficiencies in surveys may be due to small scale, outmoded or non-standard survey techniques, obsolete age, unprocessed or unapproved data, or other factors which cause the survey data to be below customary standards for the scale of the chart. A preliminary chart may or may not be published in full color. Included on the chart shall be a source diagram and a warning note stating that (all or much of) the hydrography shown on the chart is not of customary quality. The chart will retain the "Preliminary" label until it is recompiled using processed and approved source material, all smooth drafted detail is engraved, and all standard chart colors are shown. [29]

PREVENTIVE MAINTENANCE. Maintenance specifically intended to prevent faults from occurring during subsequent operation. Contrast with corrective maintenance. Corrective maintenance and preventive maintenance are both performed during maintenance time. [9]

PRIMARY COLORS. The primary colors for additive combinations consist of blue-violet, yellow-green, and red-orange light, and the secondary colors consist of blue-green (cyan), yellow, and magenta. Color scientists consider these secondary light colors to be the true primary pigment colors instead of the traditional red, yellow, and blue, and these colors are used by printers as the basis for mixing colored inks and for process color work. [30]

PRIMARY LIGHT. A major aid to navigation established for the purpose of making landfalls and coastwise passages from headland to headland or for marking areas dangerous to mariners. [37]

PRIME MERIDIAN. The meridian of longitude 0°, used as the origin for measurement of longitude. The meridian of Greenwich, England, is almost universally used for this purpose. [1]

PRIVATE AIDS TO NAVIGATION. In United States waters, those aids to navigation not established and maintained by the U.S. Coast Guard. Private aids include those established by other federal agencies with prior U.S. Coast Guard approval, those aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the U.S. Coast Guard, and those aids which are merely desired, for one reason or another, by the individual corporation, state or local government

or other body that has established the aid with U.S. Coast Guard approval. Although private aids to navigation are inspected periodically by the U.S. Coast Guard, the mariner should exercise special caution when using them for general navigation. [1]

PROGRAM. (1) A series of actions proposed in order to achieve a certain result. (2) Loosely: a routine. (3) Synonymous with "computer program." (4) To design, write and test a program as in (1). (5) Loosely: to write a routine. [22]

PROGRAMMING LANGUAGE. A language used to prepare computer programs, for example, FORTRAN, ALGOL, COBOL, PL/I, and many others. [22]

PROJECTION. The lines representing the parallels of latitude and meridians of longitude drawn on a survey sheet, map, or chart. [3]

The representation of a figure on a surface, either plane or curved, according to a definite plan. In a perspective projection this is done by means of projecting lines emanating from a single point, which may be infinity. In cartography, any systematic arrangement of meridians and parallels portraying the curved surface of the sphere or spheroid upon a plane. Also called map projection or chart projection. In photography, the reduction or enlargement of a positive or negative, by projecting the image through a lens. [17]

PROJECTION, LAMBERT CONFORMAL CONIC. A conformal projection of the conical type, on which all geographic meridians are represented by straight lines which meet in a common point outside the limits of the map, and the geographic parallels are represented by a series of arcs of circles having this common point for a centre. Meridians and parallels intersect at right angles, and angles on the earth are correctly represented on the projection. This projection may have one or two standard parallels along which the scale is held exact. [17]

PROJECTION, MERCATOR. A conformal projection of the cylindrical type. The equator is represented by a straight line true to scale; the geographic meridians are represented by parallel straight lines perpendicular to the line representing the equator; they are spaced according to their distance apart at the equator. The geographic parallels are represented by a second system of straight lines perpendicular to the family of lines representing the meridians, and therefore parallel with the equator. Conformality is achieved by mathematical analysis, the spacing of the parallels being increased with the increasing distance from the equator to conform with the expanding scale along the parallels resulting from the meridians being represented by parallel lines. Since rhumb lines appear as straight lines and directions can be measured directly, this projection is widely used in navigation. [17]

PROJECTION, POLYCONIC. A projection having the central geographic meridian represented by a straight line, along which the spacing for lines representing the geographic parallels is proportional to the distances apart of the parallels; the parallels are represented by arcs of circles which are not concentric, but whose centres lie on the line representing the central meridian, and whose radii are determined by the lengths of the elements of cones which are tangent along the parallels. All meridians except the central one are curved. This projection is neither conformal nor equal area but it has been widely used for maps of small area because of the ease with which it can be constructed. [17]

PROJECTION, SKEWED. Any standard projection used in map or chart construction, which does not conform to a general north-south format with relation to the neat lines of the map or chart. [17]

PROJECTION, TRANSVERSE MERCATOR. A projection of the cylindrical type, being in principle equivalent to the regular mercator projection turned (transversed) 90° in azimuth. In this projection, the central meridian is represented by a straight line, corresponding to the line which represents the equator on the regular mercator projection. Neither the geographic meridians, except the central meridian, nor the geodetic parallels, except the equator (if shown), are represented by straight lines. It is a conformal projection. Also called transverse cylindrical orthomorphic projection. [17]

PROJECTOR, REFLECTING. In photogrammetry, an instrument by means of which the image of an aerial photograph can be projected onto a map. By varying the position of the projector lens, the scale of the projected image can be varied, and, by tilting the table top, compensation can be made for any tilt in the photograph. [17]

PROMONTORY. High land extending into large body of water beyond the line of the coast. Called headland when the promontory is comparatively high and has a steep face. Also called foreland. [1]

PROOF. In cartography, an advanced copy of a map produced to check the design, register and/or to enable errors to be detected and corrected before final printing. [17]

PROOF CHECKING. Examination of a Proof and comparison with its sources to point out errors, omissions and improvements. [21]

PROOF-READ. The act of reading and correcting copy internally as the earliest stage of production to insure accuracy. [33]

PROPORTIONAL DIVIDERS. An instrument consisting in its simple form of two legs pointed at both ends and provided with an adjustable pivot, so that for any given pivot setting, the distance between one set of pointed ends always bears the same ratio to the distance between the other set. A change in the pivot changes the ratio. The dividers are used in transferring measurements between charts or other drawings which are not at the same scale. [17]

PROTRACTOR, THREE ARM. An instrument consisting essentially of a circle graduated in degrees, to which is attached one fixed arm and two arms pivoted at the centre and provided with clamps so that they can be set at any angle to the fixed arm, within the limits of the instrument. It is used for finding a ship's position, when the angles between three fixed and known points are measured. [17]

PROVINCE. A region composed of a group of similar bathymetric features whose characteristics are markedly in contrast with surrounding areas. [4]

PROVISIONAL CHART. A special chart for which there is an urgent need. The chart is compiled from processed and approved source material and may be smooth drafted for direct reproduction. All charted information is combined on the black plate and no colors are shown. The chart will retain the "provisional" label until all smooth drafted detail is engraved and standard chart colors are added. [29]

PROVISIONAL EDITION. A map or chart printed and distributed for temporary use with the provision that it will later be superseded. Also called preliminary edition. [10]

PUB NO. 9. American Practical Navigator; a publication of the National Imagery and Mapping Agency, originally by Nathaniel Bowditch, comprising an epitome of navigation and navigational astronomy and providing tables for solution of navigational problems. Popularly called Bowditch. [1]

PUB 117A. Radio Navigational Aids (Atlantic and Mediterranean Area); a publication of the Defense Mapping Agency Hydrographic/Topographic Center which contains data on radio aids to navigation services provided to mariners in the Atlantic and Mediterranean area. The data provides the necessary information for the mariner to use radiobeacons for radio direction finding. Information on radio direction finder and radar stations, radio time signals, radio navigational warnings, distress signals, stations transmitting medical advice, long range radionavigation systems, emergency procedures and communications instructions, etc. is also given. [1]

PUB 117B. Radio Navigational Aids (Pacific and Indian Oceans Area); a publication of the Defense Mapping Agency Hydrographic/Topographic Center which contains data on radio aids to navigation services provided to mariners in the Pacific and Indian Oceans area. The data provides the necessary information for the mariner to use radiobeacons for radio direction finding. Information on radio direction finder and radar stations, radio time signals, radio navigational warnings, distress signals, stations transmitting medical advice, long range radionavigation systems, emergency procedures and communications instructions, etc. is also given. [1]

PUB 221. (1) LORAN-C Table; a series of lattice tables published by the Defense Mapping Agency Hydrographic/Topographic Center providing the tabular counterpart of the LORAN-C chart. Through the use of the appropriate lattice table, LORAN-C lines of position can be plotted on a suitable plotting sheet or chart. Each table is fully identified by the publication number (221), pertinent suffix, and station pair. For example, Pub. 221 (2209) Pair 9970-Z is the lattice table for the 9970-Z pair in the Northwest Pacific LORAN-C chain. (2) LORAN-C Correction Table; a series of tables published by the Defense Mapping Agency Hydrographic/ Topographic Center providing additional secondary phase factor (ASF) corrections to LORAN-C time differences for all station pairs of the chain covered in each table. The tables are published primarily for navigators who utilize electronic computers to convert LORAN-C time differences to geographic coordinates. The tables are also published for use in correcting time differences for ASF when plotting LORAN-C time differences on a chart on which the overprinted LORAN-C lattice has not been compensated for ASF. Although the ASF corrections are generally too small to affect a LORAN-C fix plotted on a small-scale chart, they can become as large as +/-4 microseconds. Each table is fully identified by the publication number (221), name of chain, and group repetition interval code. For example, Pub. 221, Northeast, U.S.A., 9960, designates the table containing ASF corrections for all station pairs of the Northeast, U.S.A. chain of group repetition interval 99600. [1]

PUB 224. (1) Omega Table; a series of lattice tables published by the Defense Mapping Agency Hydrographic/Topographic Center providing the tabular counterpart of the Omega chart. Through use of the appropriate charting coordinate or lattice table, Omega lines of position

can be plotted on a suitable plotting sheet or chart having a scale as large as 1:800,000. The publication number, pertinent suffix, and station pair fully identify each lattice table, Using Pub. 224 (109) D-H, as an example, the 224 designates an Omega publication, the first digit of the suffix (109) identifies the frequency as 10.2kHz; the last two digits of the suffix identify the area of coverage of the table as area 09; the station pair (D-H) completes the full identification of the table. (2) Omega Propagation Correction Tables; a series of tables published by the Defense Mapping Agency Hydrographic/ Topographic Center providing necessary data for correcting Omega Navigation System receiver readouts, affected by the prevailing propagation conditions, to the standard conditions on which all Omega hyperbolic charts and lattice tables are based. The corrections are presented in the single station mode so that the navigator only need acquire the tables for the stations and areas desired. Each table contains propagation corrections for the station and area shown on the cover. The publication number, pertinent suffix followed by the letter C, and the designator of the single station for which a table is computed, fully identify a particular propagation correction table. Using Pub. 224 (109-C) D as an example, the 224 designates an Omega publication; the first digit of the suffix (109) identifies the frequency as 10.2kHz (2 denotes 3.4kHz); the last two digits of the suffix identify the area of coverage of the table as area 09; the letter C indicates that the table is a propagation correction table as opposed to a lattice table and the station designator D completes the full identification of the table. [1]

PUBLIC LAW 31 (SUBMERGED LANDS ACT). An act passed during the 1st session of the 83rd Congress and signed into law on May 22, 1953. Confirms and establishes the titles of the states to lands beneath navigable water within their boundaries and to the natural resources within such lands and water. The act also establishes jurisdiction and control of the United States over the natural resources of the seabed of the continental shelf seaward of state boundaries. [3]

PUBLIC LAW 212 (OUTER CONTINENTAL SHELF LANDS ACT). An act passed during the 1st session of the 83rd Congress and signed into law on August 7, 1953. Provides for the jurisdiction, control, and administration by the United States over the submerged lands seaward of the states' boundaries as defined in Public Law 31; that is, over the outer continental shelf. See Public Law 31, Continental Shelf, Outer Continental Shelf. [3]

PUBLISHED DATA (AIS). All data within GPBASE that is, wholely or in part, published on at least one NOS chart. [32]

PUBLISHER'S NOTE. A marginal note which indicates the publisher and usually place of publication. [21]

PUMPING PLATFORM COMPLEX (PPC). A single platform or a series of inter-connected platforms that have one or more of the following capabilities: (1) Pumping oil between a vessel and the shore. (2) Berthing and messing facilities for assigned personnel. (3) Landing area for helicopters. (4) Mooring and loading for small vessels. [2]

PUNCH REGISTER SYSTEM. System involving the use of prepunched holes in the flat and plate and a set of plastic pins or buttons which are used in registering succeeding flats, positioning the image on the plate, and positioning the plate on the press. [30]

Q

QUADRANGLE. A rectangular, or nearly so, area covered by a map or plat, usually bounded by given meridians of longitude and parallels of latitude. Also called quad; quadrangle map. [10]

QUALITY ASSURANCE. A continuing evaluation of the quality control process. It is not a double check on each product, but rather a "check on the checkers." Quality assurance techniques often employ a statistical sampling method to examine just enough of the products to determine that the quality control system is effective. Quality assurance is not intended to catch all the mistakes, but only to determine if the rates of mistakes that pass through the quality control system is within the acceptable limits established by management. Any problem identified by the quality assurance process should result in corrective action in the quality control process. Since quality assurance evaluates part of the productive system, e.g., quality control, it must be organizationally separate from the production manager in order to ensure objectivity. [29]

QUALITY CONTROL. A routine inspection to ensure that the product conforms with certain minimum standards and specifications that have been established by management. Quality control is usually performed at the work site by supervisors or by designated inspectors. Products that fail to meet the minimum standards are reprocessed or destroyed. [29]

QUALITY CONTROL REPORT. A report comprising a critique of the quality and adequacy of the field data acquisition and Marine Center processing of a given hydrogrpahic survey. Significant errors, conflicts, or discrepancies which cannot be expeditiously corrected in the records or on the survey are discussed, and appropriate recommendations regarding corrective action are included in the report. During the period from October 1975 through September 1982, all hydrographic surveys processed by the Marine Centers were subjected to a quality control inspection at Rockville Headquarters. See Hydrographic Survey Examination. [40]

QUAY. A structure of solid construction along a shore or bank which provides berthing for ships and which generally provides cargo-handling facilities. A similar facility of open construction is called wharf. See also Mole. [1]

QUICKSAND. Loose, yielding, wet sand which offers no support to heavy objects. The upward flow of the water has a velocity that eliminates contact pressures between the sand grains, and causes the sand-water mass to behave like a fluid. [14]

R

RACE. Swiftly flowing water in a narrow channel or river; also the channel itself which may be artificial as in a mill-race. Also a swift rush of water through a narrow channel in tidal waters and caused by the tidal movement of the waters. See Tide Race. [17]

RACON (RADAR RESPONDER BEACON). A radionavigation system that transmits a coded signal which is displayed on the user's PPI allowing him to identify the aid and determine the aid's range and bearing. [37]

RACON. (1) A transponder beacon which, when triggered by a ship's radar emission transmits a reply which provides the range and bearing to the beacon on the PPI display of the ship. The reply appears on the PPI display as a radial line or narrow sector, the racon flash extending radially from a point beyond the echo of the racon installation, or from just beyond the point where the echo would be painted if detected, due to response delay. The distance beyond may be several hundred yards. For identification purposes, the racon flash may be in Morse code, the first character usually being a dash to avoid its being confused with the possible blip formed by the echo of the racon installation. Only a few racons operate in other than the 3-centimeter band. The name racon is derived from the words radar beacon. Also called Radar Transponder Beacon. (2) As defined by the International Telecommunication Union (ITU), in the maritime radionavigation service, a receiver-transmitter device which, when triggered by a surface search radar, automatically returns a distinctive signal which can appear on the display of the triggering radar, providing range, bearing and identification information. [1]

RADAR. An electronic system designed to transmit radio signals and receive reflected images of those signals from a "target" in order to determine the bearing and distance of the "target." [37]

A radiodetermination system which measures distance and usually direction by a comparison of reference signals with the radio signals reflected or retransmitted from the target whose position is to be determined. Primary radar uses reflection only; secondary radar uses automatic retransmission on the same or a different radio frequency. Pulse-modulated radar is used for shipboard navigational applications. In this type of radar the distance to the target is determined by measuring the time required for an extremely short burst or pulse of radio-frequency energy to travel to the target and return to its source as a reflected echo. [1]

RADAR BEACON. (1) A radar transmitter whose emissions enable a ship to determine its direction and frequently position relative to the transmitter by means of the ship's radar equipment. There are two general types of radar beacons: one type, the racon, must be triggered by the ship's radar emissions; the other type, the ramark, transmits continuously and provides bearings only. See Racon, definition 2. [1]

RADAR BUOY. A buoy having corner reflectors designed into the superstructure, the characteristic shape of the buoy being maintained. This is to differentiate from a buoy on which a corner reflector is mounted. [1]

RADAR DOME. A dome shaped structure used to protect the antenna of a radar installation. [35]

RADAR REFLECTOR. A special fixture fitted to or incorporated into the design of certain aids to navigation to enhance their ability to reflect radar energy. In general, these fixtures will materially improve the aids for use by vessels equipped with radar. [37]

RADIOBEACON. Electronic apparatus which transmits a radio signal for use in providing a mariner a line of position. [37]

A radio transmitting station which emits a distinctive or characteristic signal usually for the purpose of the navigator being able to determine the direction of the source of the signal of known location by means of a radio direction finder. The direction so obtained and plotted from the signal source provides a line of position. The most common type of marine radiobeacon transmits radiowaves of approximately uniform strength in all directions. These omnidirectional beacons are called circular radiobeacons. A radiobeacon some or all of the emissions of which are directional so that the signal characteristic changes according to the vessel's bearing from the beacon is called a direction radiobeacon. A radiobeacon all or part of the emissions of which is concentrated in a beam which rotates is called a rotating radiobeacon. See also Sequenced Radiobeacon. [1]

A radio transmitter which emits a distinctive or characteristic signal used for the determination of bearings, courses or location. One intended to mark a specific location is called marker beacon. [17]

RADIOBEACON CHARACTERISTIC. The description of the complete cycle of transmission of a radiobeacon in a given period of time, inclusive of any silent period. [1]

RADIO DIRECTION FINDER. Radio receiving equipment which determines the direction of arrival of a signal by measuring the orientation of the wave front or of the magnetic or electric vector. Radio direction finders may be either manual or automatic. Also called direction finder. Formerly called radio compass. [17]

RADIO DIRECTION FINDER STATION. A radio station equipped with special apparatus for determining the direction of radio signals transmitted by ships and other stations. The bearing taken by a radio direction finder station, and reported to a ship, is corrected for all determinable errors except conversion angle. Also called direction finder station. [1]

RADIO FREQUENCY. Any electromagnetic wave occurring within that segment of the spectrum normally associated with some form of radio propagation. Radio frequencies are usually classified as very low, 3-30 kilohertz; low 30-300 kilohertz; medium, 300-3000 kilohertz; high, 3-30 megahertz; very high, 30-300 megahertz; ultra high, 300-3000 megahertz; super high, 3-30 gigahertz; extremely high, 30-300 gigahertz. [1]

RADIO MAST. A radio mast is a tall structure held vertical by guylines. [16]

RADIONAVIGATION. (1) The determination of position, or the obtaining of information relating to position, for the purposes of navigation by means of the propagation properties of radio waves. (2) As defined by the International Telecommunication Union (ITU), radiodetermination used for the purposes of navigation, including obstruction warning. [1]

RADIO STATION. A place equipped with one or more transmitters or receivers, or a combination of transmitters and receivers, including the accessory equipment necessary at one location, for carrying on a radiocommunication service. Each station is classified by the service in which it operates permanently or temporarily. [1]

RADIO TOWER. A radio tower is a latticed structure which is self-supporting. [16]

RAMARK. A radar beacon which continuously transmits a signal appearing as a radial line on the PPI, indicating the direction of the beacon from the ship. For identification purposes, the radial line may be formed by a series of dots or dashes. The radial line appears even if the beacon is outside the range for which the radar is set, as long as the radar receiver is within the power range of the beacon. Unlike the Racon, the ramark does not provide the range to the beacon. The name ramark is derived from the words radar marker. [1]

RAMP. A sloping structure that can either be used, as a landing place, at variable water levels, for small vessels, landing ships, or a ferry boat, or for hauling a cradle carrying a vessel. [17]

RANGE. (1) Two or more objects in line. Such objects are said to be in range. An observer having them in range is said to be on the range. Two beacons are frequently located for the specific purpose of forming a range to indicate a safe route or the centerline of a channel. Called leading marks in British terminology. (2) Distance in a single direction or along a great circle. (3) The extreme distance at which an object or light can be seen is called visual range. When the extreme distance is limited by the curvature of the earth and the heights of the object and the observer, this may be called geographic range; when the range of a light is limited only by its intensity, clearness of the atmosphere, and sensitiveness of the observer's eyes, it may be called luminous range. (4) The extreme distance at which a signal can be detected or used. The maximum distance at which reliable service is provided is called operating range. The spread of ranges in which there is an element of uncertainty of interpretation is called critical range. (5) The distance a craft can travel at cruising speed without refueling is called cruising radius. (6) The difference in extreme values of a variable quantity. See also range of tide. (7) A series of mountains or mountain ridges is called mountain range. (8) A predetermined line along which a craft moves while certain data are recorded by instruments usually placed below the line, or the entire station at which such information is determined. See also degaussing range. (9) An area where practice firing of ordnance equipment is authorized. (10) On the sea floor, a series of ridges or seamounts. [1]

RANGE, GEOGRAPHIC(AL). The greatest distance at which a light can be seen as a function of the curvature of the earth and heights of the light source and the observer. [17]

RANGE, LUMINOUS. The greatest distance at which a light can be seen merely as a function of its luminous intensity, the meteorological visibility, and the sensitivity of the observer's eye. [17]

RANGE, NOMINAL. The luminous range of a light in a homogeneous atmosphere in which the meteorological visibility is 10 sea miles. [17]

RANGE OF TIDE. The difference in height between consecutive high and low tides waters. The mean range is the difference in the height between mean high water and mean low water. The great diurnal range or diurnal range is the difference in height between mean higher high water and mean lower low water. Where the type of tide is diurnal the mean range is the same as the diurnal range. For other ranges see Spring Tides. [1]

RANGE OF VISIBILITY. The extreme distance at which an object or light can be seen. See Range, Geographical; Range, Luminous; and Range, Nominal. [17]

RAPID(S). Portions of a stream with accelerated current where it descends rapidly but without a break in the slope of the bed sufficient to form a waterfall. Usually used in the plural. [17]

RASTER. A regular, two-dimensional arrangement of physical or conceptional elements, e.g., electrical wires or addressable points. Normally the arrangement is line by line across a given surface or area, like for example the face of a CRT. Sometimes synonymous with grid, and also with matrix. [22]

RASTER PLOTTER. A plotter that generates the image by making appropriate elements of a raster visible, e.g., by printing small dots line by line across a whole graphic. Contrast with line plotter. [22]

RAVINE. A gulch; a small gorge or canyon, the sides of which have comparatively uniform slopes. [4]

RAYDIST. The general name for several radiolocation systems produced by the Teledyne Hastings-Raydist Company, Hampton, Virginia. The Raydist DR-S system operates in the band 1.6-4.0 MHz and is comparable in range and accuracy with Hi-Fix and Sea-Fix. Unlike Hi-Fix and Sea-Fix, Raydist DR-S can operate with up to four users in the range-range configuration. Also unlike Hi-Fix and Sea-Fix, phase locking is unnecessary. In the normal or range-range configuration, there are two base stations (red and green) ashore and a mobile transmitter and Raydist Navigator aboard the survey vessel. [1]

REACH. The comparatively straight segment of a river or channel between two bends. That part of a winding river between the last bend and the sea is called a sea reach; that part between the harbor and the first bend is called a harbor reach. [1]

READ. To acquire or interpret data from a storage device, a data medium, or any other source. [22]

REAL TIME. Time in which reporting on events or recording of events is simultaneous with the events. [26]

REAL-TIME INPUT (ISO). Input data received into a data processing system within time limits that are determined by the requirements of some other system or at instants that are so determined. [20]

REBUILT. A fixed aid, previously destroyed, which has been restored as an aid to navigation. [37]

RECIPROCAL BEARING. A bearing differing by 180° or one measured in the opposite direction, from a given bearing. [1]

RECOMMENDED DIRECTION OF TRAFFIC FLOW. A traffic flow pattern indicating a recommended directional movement of traffic where it is impractical or unnecessary to adopt an established direction of traffic flow. [19]

RECOMMENDED TRACK. A route which has been specially examined to ensure so far as possible that it is free of dangers and along which ships are advised to navigate. [19]

RECONNAISSANCE. In surveying, a general examination or survey of the main features, or certain specific features, of a region, usually as a preliminary to a more detailed survey. [17]

RECONSTRUCTED CHART. This term is used when the accumulation of basic charting information becomes very extensive, if there are minor changes to the chart limits, or if the chart is produced using computer-supported compilation and scribing techniques and is recompiled on a new projection. [29]

RECORD. (1) (ISO) A set of related data or words treated as a unit, e.g., in stock control, each invoice could constitute one record. [20]

(1) A set of one or more consecutive fields on a related subject, as an employee's payroll record. Although a record need not be a block in length, such an arrangement is often useful. (2) A listing of information, usually in printed or printable form; one output of a compile consisting of a list of the operations and their positions in the final specific routine and containing information describing the segmentation and storage allocation of the routine. (3) To make a transcription of data by a systematic alteration of the condition, property, or configuration of a physical medium, e.g., placing information on magnetic tapes or a drum by means of magnetized spots. (4) A group of related facts or fields of information treated as a unit, thus a listing of information usually in printed or printable form. (5) To put data into a storage device. (6) To group related facts or fields of information treated as a unit. [34]

A collection of related items of data, treated as a unit. For example, one line of an invoice may form a record; a complete set of such records may form a file. See also "feature record." To store data on a data medium (usually by means of a data recorder). [22]

RECOVERY OF STATION. In surveying, the identifying and checking of an original station. This is considered as recovered when its mark (monument) is identified as authentIc and proved to be occupying its original site. [17]

RECREATIONAL CHARTS. These U.S. National Ocean Service charts are a series of large-scale charts providing sequential page coverage for selected Great Lakes areas. These charts are published in a book format with each page being a large-scale, small-size chart. [29]

RECTANGULAR COORDINATES. Magnitudes defining a point relative to two perpendicular lines, called axes. The magnitudes indicate the perpendicular distance from each axis. The vertical distance is called the ordinate and the horizontal distance the abscissa. This is a form

of Cartesian coordinates. [1]

RED TIDE. A red or reddish-brown discoloration of surface waters, most frequently in coastal regions, caused by concentrations of certain microscopic organisms, particularly dinoflagellates. Toxins produced by the dinoflagellates can cause mass kills of fishes and other marine animals. Airborne particles which are optic and respiratory irritants to humans and animals may be carried from red tide areas overland. Red tides may develop rapidly, apparently as a result of an abrupt change in one or more environmental factors. In some regions at least notably off the west coast of Florida, the onset of red tide appears to follow increased rainwater runoff from the land; the introduction by this means of one or more scarce nutrient elements into the sea is believed to permit the dinoflagellates to multiply rapidly. See Discolored Water. [12]

REDUCTION, GRAPHIC. Reduction of scale by superimposing a network of lines on the original and redrawing to a similar pattern of lines at a smaller scale. [21]

REDUCTION OF SOUNDINGS. Recorded soundings on hydrographic surveys shall be corrected for any departure from true depths attributable to the method of sounding or to a fault in the measuring apparatus and for the elevation of the tide or water level above or below the chart datum (tidal or stage correction). Corrections shall be applied in the same unit in which the soundings have been recorded. Fractions of correction units are entered in the records as decimals. Required corrections to soundings include any or all of the following:

Corrections for erroneously scaled values.
Heave error (wave effects).
Transducer draft.
Settlement and squat (or lift).
Velocity of sound through water.
Reduction to datums of reference.
Compensation for the following errors, if present, in the graphic depth recording equipment:

Variation of the initial from the adopted index, speed, and radius of rotation of the recording stylus arm.
Corrections for phase errors between scale settings, misalignment of recording paper, and other instrumental errors caused by variations in signal strength and time lags in the circuitry.

Periodic measurements of temperature and salinity shall be made to compute velocity corrections to echo soundings except in areas where satisfactory bar checks can be obtained down to at least 75% of the range of depths sounded. If oceanographic data are used to determine velocity corrections for soundings, at least one temperature and salinity cast should be taken each month in an area representative of the deepest waters surveyed. The specific frequency for observing velocity data is a matter of judgment and is dependent upon the complexity of variations in the area. Special instructions for velocity corrections will be issued for surveys in areas requiring unusual methods, such as those conducted in the Gulf Stream. [5]

REEF. A rocky or coral elevation dangerous to surface navigation which may or may not uncover at the sounding datum. A rocky reef is always detached from shore; a coral reef may or may not be connected with the shore. [3]

REFERENCE DATUM. A general term applied to any datum, plane, or surface used as a reference or base from which other quantities can be measured. [1]

REFERENCE ELLIPSOID. See Reference Spheroid. [17]

REFERENCE LINE. Any line which can serve as a reference or base for the measurement of other quantities. Also called datum line. [17]

REFERENCE MARK. In surveying, a supplementary mark of permanent character close to a station or to a base terminal, to which it is related by an accurately measured distance and direction, and/or a difference in elevation. [17]

REFERENCE POINT. Any point which can serve as a reference or base for the measurement of other quantities. Also called datum point. [17]

REFERENCE SPHEROID (OR ELLIPSOID). A theoretical figure whose dimensions closely approach the dimensions of the Geoid. The exact dimensions are determined by various considerations of the section of the earth's surface considered. The spheroids of Bessel, Clarke, Delambre, Everest, Hayford, Helmert and others have been adopted as reference spheroids in geodetic work by different countries. Also called spheroid of reference, or ellipsoid of reference. [17]

REFERENCE STATION. A tide or current station for which independent daily predictions are given in the "Tide Tables" and "Tidal Current Tables," and from which corresponding predictions are obtained for subordinate stations by means of differences and ratios. See Subordinate Current Station. [7]

REFLECTING PROJECTOR. An instrument which is used to project the image of photographs, maps, or other graphics onto a copying table. The scale of the projected image can be varied by raising of lowering the projector or in some models the copy board. These latter models also allow the tilting of the copy board in x- and y-directions in order to compensate for tip and tilt distortion in aerial photographs. [10]

REGISTER MARKS. Designated marks, such as small crosses, circles, or other patterns applied to original copy prior to reproduction to facilitate registration of plates and to indicate the relative positions of successive impressions. Also called corner marks; corner ticks; register ticks; registration ticks; ticks. [10]

REGISTRATION. Correct positioning of one component of a composite map image in relation to the other components. Achieved, for example, by punching sets of holes, having a fixed horizontal relationship to each other, in each component sheet and then attaching the components together using specially designed fasteners. [25]

RELIEF. (1) The elevations or the inequalities, collectively of a land surface; represented on graphics by contours, hypsometric tints, shading, spot elevations, hachures, etc. Similar inequalities of the ocean bed or their representation are called Submarine Relief. (2) The removal of a buoy from a station and the providing of another buoy having the operating characteristics authorized for that station. [1]

RELIGHTED. An extinguished aid returned to its advertised light characteristics. [37]

RELOCATED. Authorized movement of an aid from one position to another in the immediate vicinity. [37]

REMOVABLE SPAN BRIDGE. A bridge with a portable or pontoon span that can be removed or drawn aside.

REPEATABILITY. (1) A measure of the variation in the accuracy of an instrument when identical tests are made under fixed conditions. (2) In a navigation system, the measure of the accuracy with which the system permits the user to return to a specified point as defined only in terms of the coordinates peculiar to that system. [1]

REPEATABLE ACCURACY. In a navigation system, the measure of the accuracy with which the system permits the user to return to a position as defined only in terms of the coordinates peculiar to that system. For example, the distance specified for the repeatable accuracy of the system such as LORAN-C is the distance between two LORAN-C positions established using the same stations positions established using the same stations and time-difference readings at different times. The correlation between the geographical coordinates and the system coordinates may or may not be known. [1]

REPLACED. An aid previously off station, adrift, or missing restored by another aid of the same type and characteristics. [37]

REPLACED (TEMPORARILY). An aid previously off station, adrift, or missing restored by another aid of different type and/or characteristic. [37]

REPRESENTATIVE FRACTION. The scale of a map or chart expressed as a fraction or ratio that relates unit distance on the map to distance measured in the same unit on the ground. Also called natural scale, fractional scale. See also Numerical Scale. [1]

A term applied to a fractional scale where the numerator is unity. Also called the "R.F." of the map. [3]

REPRINT. A reprinting of a chart without revision, necessitated by the depletion of stock. The issue is an exact duplicate of the current issue with no changes in printing or publication dates. [29]

An issue of a chart the supply of which is approaching exhaustion. The reprint is an exact duplicate of the current issue with no changes in printing or publication data. [17]

REPRODUCIBLE. An original drawing, photographic positive or negative on stable base material to be used in the process of reproduction. [17]

REPRODUCTION. (1) The summation of all the processes involved in printing copies from an original drawing. (2) A printed copy of an original drawing made by any of the processes of reproduction. [10]

REPRODUCTION MATERIAL. Material, generally in the form of positive or negative copies on film or glass for each color plate, from which a map or chart may be reproduced without redrafting. Also called repromat. [10]

REPROMAT. See Reproduction Material. [10]

RESET. A floating aid previously off station, adrift, or missing returned to its assigned position (station). [37]

RESTRICTED AREA. A specified area designated by appropriate authority and shown on charts, within which navigation is restricted in accordance with certain specified conditions. [17]

(1) An area (land, sea, or air) in which there are special restrictive measures employed to prevent or minimize interference between friendly forces. (2) An area under military jurisdiction in which special security measures are employed to prevent unauthorized entry. An air space of defined dimensions above the land areas or territorial waters of the state within which the flight of aircraft is restricted in accordance with certain specified conditions. May also refer to land or sea areas to which access is restricted. See also danger area; prohibited area. [13]

RESTRICTED WATERS. Areas which for navigational reasons such as the presence of shoals or other dangers confine the movements of shipping within narrow limits. [1]

RETAINED. Within Marine Chart Branch this refers only to the remote access memory of the AIS, the final disks packs. [32]

RETRACTABLE BRIDGE. A bridge with a movable span that can be withdrawn horizontally or within the remaining structure of the bridge.

RETRIEVAL. The process of selecting a desired set of data (records, files, etc.) out of computer storage and transfer of these data to a program buffer for further processing or directly to an output device. [22]

REVERSAL FILM (AUTOPOSITIVE FILM). A photographic film which is exposed and processed to give a positive image of an original without an intermediate (negative) stage. [21]

REVERSING CURRENT. A tidal current which flows alternately in approximately opposite direction with a slack water at each reversal of direction. Currents of this type usually occur in rivers and straits where the direction of flow is more or less restricted to certain channels. When the movement is towards the shore or up a stream, the current is said to be flooding, and when in the opposite direction, it is said to be ebbing. The combined flood and ebb movement (including the slack water) covers, on an average, 12.42 hours for the semidiurnal current. If unaffected by a nontidal flow, the flood and ebb movements will each last about 6 hours, but when combined with such a flow, the durations of flood and ebb may be quite unequal. During the flow in each direction the speed of the current will vary from zero at the time of slack water to a maximum about midway between the slacks. [7]

REVETMENT. Facing of stone or other material, either permanent or temporary, placed along the edge of a stream to stabilize the bank and to protect it from the erosive action of the stream. [23]

REVIEW REPORT (CIRCA EARLY 1930'S TO 1976). A report, formerly prepared in Washington Headquarters offices, which summarizes pertinent facts relating to a given hydrographic survey. Included in the report are sections which address the quality of the hydrographic survey and detailed comparisons made with prior hydrographic surveys and the appropriate nautical chart. Included in the report are specific evaluations and recommendations regarding the adequacy of the survey to supersede prior survey data and charted information. The formal review function was transferred to the Marine Centers in October 1975 (FY 1976), and the former "Review Report" was renamed the "Verifier's Report." See verifier's report, evaluation report and section 6.6 of the Hydrographic Manual-Fourth Edition. [40]

REVISED PRINT. A chart issue that does not cancel a current edition; the revisions are minor, the edition number remains the same but the print date is changed, and the chart is designated a revised print of that chart. The date of a revised print is shown to the right of the edition date. [29]

REVISED TOPOGRAPHIC MAP. A revised topographic map is similar to a revision print except that the base map is a copy of a topographic map published by the U.S. Geological Survey or another non-NOS agency. [32]

REVISION. The process of bringing the information on a map up to date. Continuous revision: a system designed to keep the information on a map up to date at all times. [21]

REVISION CYCLE. The proposed time interval between successive revisions of a map. [21]

REVISION PRINT. This is a copy of a registered NOS "T" or "TP" map revised by application of shoreline and other features from aerial photographs held to map detail or plotted survey control. The revision print may contain selected revisions only and should not be considered a complete revision of the registered map. The original revision print will show changes in red. The label "Revision Print" will be clearly shown along with the dates of the photographs and other sources used during revision. [32]

RHUMB DISTANCE. The length of the track a ship makes when sailing from one place to another without changing her course. [36]

RHUMB LINE. A line on the surface of the earth making the same oblique angle with all meridians; a loxodrome or loxodromic curve spiraling toward the poles in a constant true direction. Parallels and meridians, which also maintain constant true directions, may be considered special cases of the rhumb line. A rhumb line is a straight line on a Mercator projection. Sometimes shortened to Rhumb. [1]

A continually curving line on the earth which cuts all the meridians at the same angle and always approaches the pole but theoretically never reaches it. A ship sailing a "rhumb" is on one course continuously. The rhumb line is a straight line only on the Mercator projection. See Mercator Projection. [3]

A line that crosses successive meridians at a constant angle. The Mercator map projection is the only map projection on which a rhumb line is represented by a straight line. Other names for rhumb line are loxodrome, loxodromic curve, equiangular spiral, and Mercator track. [39]

RHUMB LINE COURSE. The direction of the rhumb line from the point of departure to the destination, expressed as the angular distance from a reference direction, usually north. Also called Mercator course. [1]

RHYTHMIC LIGHT. A light showing intermittently with a regular periodicity. [1]

RIDGE. A long and narrow elevation with steep sides; a long, narrow elevation of the sea floor, with steep sides and more irregular topography than a rise. [4]

RIGHT BANK. That bank of a stream or river on the right of the observer when he is facing in the direction of flow, or downstream. See also Left Bank. [1]

RIGHT-JUSTIFY. (1) (ISO) To shift the contents of a register, if necessary, so that the character at the right-hand end of the data that have been read or loaded into the register is at a specified position in the register. (2) (ISO) To control the positions of characters on a page so that the right-hand margin of the printing is regular. (3) To align characters horizontally so that the right-most character of a string is in a specified position. [20]

RIGHT-READING. A descriptive term for an image which, when viewed through the base, reads the same as the original. Other terms sometimes used to identify image direction, such as normal reading, natural readings, etc., are not recommended because of possible confusion in negative-positive relationship. [10]

RINCON. Corner or cove; an angular recess or hollow bend in a mountain, riverbank, cliff, or the like (Local in Southwest) (Sp. origin.) [4]

RIPARIAN BOUNDARIES. Water boundaries, or boundaries formed by the sea or a river. The general rule is that riparian boundaries shift with changes due to accretion or erosion but retain their original location if brought about by avulsion or by artificial causes. See Riparian Lands. [3]

RIPARIAN LANDS. In strictness, lands bordering on a river. The term "riparian" is also used as relating to the shore of the sea or other tidal water, or of a lake or other considerable body of water not having the character of a watercourse. [3]

RIPARIAN RIGHTS. The rights of an owner of land contiguous to a navigable body of water and include principally the right of access to the water; the right to build piers, wharves, docks, and other improvements to the line of navigation; the right to reclaim land, and the right to accretions. [3]

RIP CURRENT. A strong surface current flowing seaward from the shore. It usually appears as a visible band of agitated water and is the return movement of water piled up on the shore

by incoming waves and wind. With the seaward movement concentrated in a limited band its velocity is somewhat accentuated. A rip consists of three parts: the feeder currents flowing parallel to the shore inside the breakers; the neck, where the feeder currents converge and flow through the breakers in a narrow band or "rip"; and the head, where the current widens and slackens outside the breaker line. A rip current is often miscalled a rip tide. Also rip surf. [14]

A narrow intense current setting seaward through the surf zone. It removes the excess water brought to the zone by the small net mass transport of waves. It is fed by longshore currents. Rip currents usually occur at points, groins, jetties, etc., of irregular beaches, and at regular intervals along straight, uninterrupted beaches. [7]

RIPRAP. A layer of broken rock, cobbles, boulders, or fragments of sufficient size and thickness to resist the erosive forces of flowing water or wave action. Such structures usually are used to protect channels with relatively high velocity flow, shores, slopes, slopes on dams, or outlets of structures. [23]

Stones or broken rock thrown together without order to provide a revetment. [1]

RIPRAP MOUNDS. Mounds of riprap maintained at certain light structures to protect the structures against ice damage and scouring action. Uncharted submerged portions present hazard to vessels attempting to pass extremely close aboard. [1]

RIPS. Agitation of water caused by the meeting of currents or by a rapid current setting over an irregular bottom. Called tide rips when a tidal current is involved. See also Overfalls, Rip Current. [1]

A turbulent agitation of water generally caused by the interaction of currents and wind; in nearshore regions rips may also be caused by currents flowing swiftly over an irregular bottom. [17]

RISE. A long, broad elevation that rises gently and generally smoothly from the sea floor. [4]

RIVER. A natural stream of water, or greater volume than a creek or rivulet, flowing in a more or less permanent bed or channel, between defined banks or walls, with a current which may either be continuous in one direction or affected by the ebb and flow of the tidal current. [1]

ROAD. An open anchorage affording less protection than a harbor. Some protection may be afforded by reefs, shoals, etc. Often used in the plural. Also called roadstead. [1]

ROADSTEAD. A sheltered area of water where depth, and the nature of the bottom make it suitable for ships to anchor; also known as road although the latter term is usually used in the plural, e.g., Royal Roads. [35]

ROCK. (1) An isolated rocky formation or a single large stone, usually one constituting a danger to navigation. It may be always submerged, always uncovered, or alternately covered and uncovered by the tide. A pinnacle is a sharp-pointed rock rising from the bottom. (2) The naturally occurring material that forms the firm, hard, and solid masses of the ocean floor. Also, rock is a collective term for masses of hard material generally not smaller than 256

millimeters. [1]

ROCK AWASH. In National Ocean Service terminology, a rock exposed at any stage of the tide between the datum of mean high water and the sounding datum, or one just bare at these datums. For cartographic purposes, in order that the charted symbols may reflect the most probable condition of the rock as seen by the mariner, rocks the summits of which are in the zone between one foot above mean high water and one foot below the sounding datum on the Atlantic and Gulf coasts and two feet on the Pacific coast are shown as rocks awash. [29]

A rock that becomes exposed, or nearly so, between chart sounding datum and mean high water. In the Great Lakes, the rock awash symbol is used on charts for rocks that are awash, or nearly so, at low water datum. [1]

ROTARY CURRENT. A tidal current that flows continually with the direction of flow changing through all points of the compass during the tidal period. Rotary currents are usually found offshore where the direction of flow is not restricted by any barriers. The tendency for the rotation in direction has its origin in the Coriolis force and, unless modified by local conditions, the change is clockwise in the Northern Hemisphere and counterclockwise in the Southern. The speed of the current usually varies throughout the tidal cycle, passing through the two maxima in approximately opposite directions and the two minima with the direction of the current at approximately 90° from the direction at time of maximum speed. [7]

ROUNDABOUT. A routing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counterclockwise direction around the separation point or zone. A circular area within definite limits in which traffic moves in a counter-clockwise direction around a specified point or zone. [19]

ROUTE CHARTS. These U.S. National Ocean Service charts are designed for river and narrow waterway coverage, and for much of the Intracoastal Waterways. Route charts are published in the small-craft pocket fold format. [29]

ROUTEING. A complex of measures concerning routes aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, tracks, areas to be avoided, inshore traffic zones and deep water routes. [19]

ROUTING SYSTEM. Any system of one or more routes and/or routing measures aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, inshore traffic zones, roundabouts, precautionary areas and deep water routes. [19]

ROUTINE. An ordered set of instructions that have some general or frequent use. For example, a computer program which is used as part of other programs. [22]

RUIN. A ruin is a structure in a decayed or deteriorated condition resulting from neglect or disuse, or a damaged structure in need of repair. A ruin is considered hazardous if it extends over or into navigable waters and thus represents a danger to surface navigation. [29]

RULES OF THE ROAD. The International Regulations for Preventing Collisions at Sea, commonly called International Rules of the Road, and the Inland Rules of the Road to be

followed by all vessels while navigating upon certain inland waters of the United States. Also called Rules of Navigation. [1]

RUN STREAM. A listing of logical, coded instructions designed to execute (run) a computer program. [29]

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S

SADDLE. A low point on a ridge or crestline; a ridge connecting two higher elevations; a low point on a ridge or between seamounts. [4]

SAFETY LANES. Specified sea lanes designated for use in transit by submarines and surface ships to prevent attack by friendly forces. [13]

SAFETY ZONES. Safety zones may be established around OCS facilities being constructed, maintained, or operated on the Outer Continental Shelf to promote the safety of life and property on the facilities, their appurtenances and attending vessels, and on the adjacent waters within the safety zones. [2]

SAILING CHARTS. These U.S. National Ocean Service charts are published at a scale smaller than 1:600,000, and are intended for planning and for fixing the mariner's position as the coast is approached from the open ocean or for sailing along the coast between distant ports. The shoreline and topography are generalized and only offshore soundings, principal navigational lights and buoys, and landmarks visible at considerable distances are shown. [29]

SAILING DIRECTIONS. (1) A descriptive book for the use of mariners, containing detailed information of coastal waters, harbor facilities, etc. of an area. For waters of the United States and its possessions, they are published by the National Ocean Service and are called United States Coast Pilots. Sailing directions, as well as light lists, provide the information that cannot be shown graphically on the nautical chart and that is not readily available elsewhere. They are of ancient origin. The early Greek name for such a volume was Periplus, meaning literally "a sailing round." Sometimes called pilot. (2) The new sailing directions published by the Defense Mapping Agency Hydrographic/Topographic Center are designed to assist the navigator in planning a voyage of any extent, particularly if it involves an ocean passage. In the new format the previous 70 volumes are replaced with 43 volumes: 35 Sailing Directions (Enroute) and 8 Sailing Directions (Planning Guide). Port facilities data are contained in Pub. No. 150, World Port Index. Each Planning Guide covers one of the world's great land-sea areas based on an arbitrary division of the world's seaways into eight "ocean basins." In contrast to the localized method used previously, the Planning Guide shows entire recommended routes as they originate from all major U.S. ports and naval bases and terminate at foreign ports. All radionavigation systems pertaining to the ocean area are described. The national and international systems of lights, beaconage, and buoyage in the ocean basin are also described and illustrated. Other information such as that pertaining to the ocean basin environment, warning areas, government regulations, communications, etc. is also included to facilitate voyage planning. Each enroute volume includes detailed coastal and port approach information which supplements the largest scale chart of the area covered. Special graphics depict coastal winds, weather, tides, currents, and ice. Outer dangers are fully described, but inner dangers which are well charted are, for the most part, omitted. Coastal descriptions and views, useful for radar and visual piloting, are included. Anchorages are listed. Directions for entering ports are depicted, where appropriate, by means of chartlets, sketches and photographs. An index-gazeteer lists described and charted features. See also United States Coast Pilot. [1]

ST. ELMO'S FIRE. A luminous discharge of electricity from pointed objects such as the masts and yardarms of ships, lightning rods, steeples, etc., occurring when there is a considerable atmospheric difference in potential. Also called corposant, corona discharge. [1]

SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION: SLSDC. The Saint Lawrence Seaway Development Corporation was established by an act of Congress approved May 13, 1954 (33 U.S.C. 981-990). The Corporation, one of the operating administrations of the Department of Transportation, is self sustaining, being financed from revenues received from tolls charged for the use of its facilities.

The Corporation, a wholly Government-owned enterprise, is responsible for the development, operation, and maintenance of that part of the Seaway between Montreal and Lake Erie, within the territorial limits of the United States.

It is the function of the Seaway Corporation to provide a safe, efficient, and effective water artery for maritime commerce both in peacetime and in time of national emergency. The Seaway Corporation charges tolls in accordance with established rates for users of the Seaway which it negotiates with the St. Lawrence Seaway Authority of Canada. The Corporation coordinates its activities with its Canadian counterpart, particularly with respect to overall operations, traffic control, navigation aids, safety, season extension, and related programs designed to fully develop the fourth seacoast. As a self-sustaining entity, it encourages the development of traffic through the Great Lakes Seaway system so as to contribute significantly to the comprehensive economic and environmental development of the entire region. [27]

SALT MARSH. Flat, poorly drained coastal swamps which are flooded by most high tides. [17]

SALT PANS. Shallow pools of brackish water used for the natural evaporation of sea water to obtain salt. [17]

SANCTUARY, NATIONAL MARINE. Area established under provisions of the Marine Protection, Research, and Sanctuaries Act of 1972, Public Law 92-532 (86 Stat. 1052), for the preservation and restoration of its conservation, recreational, ecological, or esthetic values. Such an area may lie in ocean waters as far seaward as the outer edge of the continental shelf, in coastal waters where the tide ebbs and flows, or in the Great Lakes and connecting waters, and, may be classified as a habitat, species, research, recreational and esthetic, or unique area. [25]

SANDING. An irregular dot pattern used on some of the early hydrographic surveys to accentuate the area between the high and low-water lines. [17]

SANDWAVE. A large wavelike sediment feature in very shallow water and composed of sand. The wavelength may reach 100 meters; the amplitude is about 0.5 meter. Also called megaripple. [1]

SANTA ANA. A strong, dust-laden foehn occurring in Southern California near the mouth of the Santa Ana pass and river. [1]

SARGASSO SEA. The west central region of the subtropical gyre of the North Atlantic Ocean. It is bounded by the North Atlantic, Canary, Atlantic North Equatorial, and Antilles Currents, and the Gulf Stream. It is characterized by the absence of well-marked currents and by large quantities of drifting Sargassum, or gulf-weed. [1]

SATELLITE TRIANGULATION. The determination of the angular relationships between two or more stations by the simultaneous observation of an earth satellite from these stations. [1]

SCALE. The relationship between a linear dimension on a chart and the actual dimension represented is expressed, usually, as a ratio. Thus, the ratio 1:10,000 or 1/10,000 means that one unit of measure on the chart represents 10,000 of the same unit on the surface of the earth. Just as 1:4 or 1/4 is larger than 1:8 or 1/8, a 1:40,000 scale chart is larger than a 1:80,000-scale chart. Consequently, a large-scale chart will show chart features in more detail but will cover a smaller area; a smaller scale chart will be more generalized but will cover a larger area. [29]

The relation that a measured distance on a survey, map, or chart bears to the corresponding actual distance on the earth for example, if 1 inch on the survey or chart corresponds to 1,000 feet (12,000 inches) on the ground, the scale would be expressed as 1 inch = 1,000 feet. Expressed as a ratio this would be a scale of 1:12,000. See Fractional Scale. [3]

(1) A series of marks or graduations at definite intervals. A linear scale is a scale graduated at uniform intervals; a logarithmic scale is a scale graduated in the logarithms of uniformly-spaced consecutive numbers. (2) The ratio between the linear dimensions of a chart, map drawing, etc., and the actual dimensions represented, as 1:2,000,000 or 27,430 nautical miles to an inch. See also Bar Scale; Representative Fraction; Scale, Small; Scale, Large. [1]

SCALE, BAR. A graduated line on a map, plan, photograph, or mosaic, by means of which actual ground distances may be determined. Also called graphic scale or linear scale. [17]

SCALE, BORDER. A scale drawn along the border of chart. [17]

SCALE, CONVERSION. Reduction or enlargement of a map by graphical, mechanical, optical or photographic means. [21]

SCALE, EQUIVALENT. The relationship which a small distance on a map, chart or graphic bears to the corresponding distance on the earth, expressed as an equivalence. [17]

SCALE FACTOR. A multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance on the datum of the map. Also, in the state coordinate systems, scale factors are applied to geodetic lengths to obtain grid lengths, or to grid lengths to obtain geodetic lengths. Both are lengths on a sea level datum, but the grid lengths are affected by the scale change of the map projection. [10]

A multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance on the datum of the map. A conventional modification which may be applied to the majority of map projections. This is the multiplication of the principal scale by some numerical constant which is slightly less than unity. This has the effect of changing all

particular scales by a corresponding amount and, since both maximum and minimum particular scales are similarly modified, the special properties of the projection are unaffected. The effect is to produce a better balance of positive and negative scale errors over the mapped area. [17]

SCALE, FRACTIONAL. See Scale, Natural. [17]

SCALE, GRAPHIC. See Scale, Bar. [17]

SCALE, LARGE. A scale involving a relatively small reduction in size. A large scale chart is one covering a small area. The opposite is small scale. See Scale, Natural. [17]

SCALE, LATITUDE. The subdivided east and west borders of a Mercator chart into degrees and minutes. A variant of the bar scale, since a minute of latitude is very nearly equal to a nautical mile. [17]

SCALE, LINEAR. See Scale, Bar. [17]

SCALE, LOGARITHMIC. A scale graduated in the logarithms of uniformly-spaced consecutive numbers. [17]

SCALE, NATURAL. The ratio between the linear dimensions of a chart, drawing, etc., and the actual linear dimensions represented, expressed as a proportion. Occasionally called representative fraction, fractional scale or numerical scale. [17]

SCALE, NUMERICAL. See Scale, Natural. [17]

SCALE OF REPRODUCTION. The enlargement or reduction ratio of an original to the final copy. This ratio is expressed as a diameter, percent, times (X), or a fraction. Also called enlargement factor; reduction factor; reproduction ratio. [10]

SCALE, SMALL. A scale involving a relatively large reduction in size. A small scale chart is one covering a large area. The opposite is large scale. See Scale, Natural. [17]

SCALE, SPEED. A graphic scale by means of which the rate of speed of a survey ship, or the distance travelled in a given time can be determined quickly and accurately. [17]

SCALING. Information of the size of a graphic or part thereof (e.g., a display element) according to a given factor and relative to a given scaling origin, the point which is kept at its place during the transformation. This is achieved by multiplication of coordinates relative to this origin by the scaling factor. [22]

SCAN. To examine sequentially, part by part, e.g., by moving a measuring device across a certain area to be scanned. Normally the movement is performed in a regular pattern (e.g., line by line) but it may also be irregular, e.g., random. [22]

SCANNER. A device that scans, e.g., (1) In photographic reproduction: an optical scanner that raster scans a photograph mounted on a drum and at the same time reproduces the image with changed density characteristics by raster plotting (see "raster plotter") on the other end

of the same drum (2) In digitizing (2): a raster scan digitizing device. The data obtained by scanning may be used to calculate coordinates describing the geometry of graphic features and/or to recognize the quality of certain features. (3) In remote sensing: a device measuring the intensity of certain frequencies of radiation emitted by, or reflected from, a certain area on the ground which is scanned. This may also include digitizing (1) of the measured intensities. [22]

SCARP. A steep slope extending over a considerable distance and marking the edge of a terrace, plateau, bench, etc. [23]

SCARP, BEACH. An almost vertical slope along the beach caused by erosion by wave action. It may vary in height from a few inches to several feet, depending on wave action and the nature and composition of the beach. [14]

SCOURING BASIN. A basin in which a quantity of water is impounded during the flood tide and the contents retained until a suitable time, about low water, when the gates are opened again and a volume of water is let out to maintain desired depth of the entrance channel by scouring the bottom. Also called sluicing pond. [36]

SCREEN. A sheet of transparent film, glass or plastic carrying a ruling or other regularly repeated pattern which may be used in conjunction with a mask, either photographically, or photomechanically, to reproduce areas of the pattern. [21]

SCREEN ANGLE. The angle, measured clockwise from the vertical, at which a screen must be set. When more than one screen is employed, this angle is critical if a Moire Effect is to be avoided. [21]

SCREEN DEVICE. Used for breaking continuous-tone copy into a series of small dots when producing halftone negatives; may consist of a ruled pattern on a glass base or a pattern on an acetate base. Also, term applied to photographing copy through a screen. [30]

SCREENING. This is the process of examining an entire document for applicable charting information. All documents that are registered are screened and some are eliminated from further consideration, either by the Nautical Data Section or most often by the Area Team. A Corps of Engineers blueprint showing project limits but no specific project status would be marked as History on the standard and not forwarded to the area team. Or a document is examined by an area team cartographer and marked "No Correction." Either example is a cartographic decision that the document contains no information that would be applicable to NOS nautical charts. These documents are archived. [32]

SCRIBE CURSOR. A special digitizer cursor, used like a scribing tool, which permits smooth line following. [22]

SCRIBER. A sharp pointed tool used to produce ruling by scraping the emulsion from a negative according to the ruling desired. [33]

SCRIBING. A method of preparing a map or chart by cutting the lines into a prepared coating. (The process of preparing a negative which can be reproduced by contact exposure. Portions of a photographically opaque coating are removed from a transparent base with specially

designed tools.) Also called negative scribing. [10]

SCRIBING COATING (SCRIBE COATING). A non-actinic coating, on a translucent base, through which lines or other symbols may be cut. [21]

SEA. (1) A body of salt water more or less confined by continuous land or chains of islands and forming a region distinct from the great masses of water. (2) A body of water nearly or completely surrounded by land, especially if very large or composed of salt water. Sometimes called inland sea. See also lake. (3) Ocean areas in general, including major indentations in the coast line, such as gulfs. See also open sea, high sea. (4) Waves generated or sustained by winds within their fetch as opposed to swell. (5) The character of a water surface, particularly the height, length (period), and direction of travel of waves generated locally. A smooth sea has waves no higher than ripples or small wavelets. A short sea has short, irregular, and broken waves. A confused sea has a highly disturbed surface without a single, well-defined direction of travel, as when waves from different directions meet following a sudden shift in the direction of the wind. A cross sea is a series of waves imposed across the prevailing waves. A sea may be designated as head, beam, quartering, or following if the waves are moving in a direction approximately 180°, 90°, 45°, or 0°, respectively, from a vessel's heading. [1]

SEABOARD. The region of land bordering the sea. The terms Seaboard, Coast, and Littoral have nearly the same meanings. Seaboard is a general term used somewhat loosely to indicate a rather extensive region bordering the sea. Coast is the region of indefinite width that extends from the sea inland to the first major change in terrain features. Littoral applies more specifically to the various parts of a region bordering the sea, including the coast, foreshore, backshore, beach, etc. [1]

SEA BUOY. The outermost buoy marking the entrance to a channel or harbor. Called landfall buoy in British terminology. [1]

SEA GATE. (1) A way giving access to the sea such as a gate, channel or beach. (2) A gate which serves to protect a harbor or tidal basin from the sea, such as one of a pair of supplementary gates at the entrance to a tidal basin exposed to the sea. [1]

SEA LEVEL DATUM (SLD). An obsolete term. See National Geodetic Vertical Datum; Mean Sea Level. [7]

SEA MILE. An approximate mean value of the nautical mile equal to 6,080 feet, or the length of a minute of arc along the meridian at latitude 48°. [1]

SEA MILE (BRITISH TERMINOLOGY). The length of one minute of arc, measured along the meridian in the latitude of the position; its length varies both with the latitude and with the figure of the earth in use. [17]

SEAMOUNT (OR PEAK). An isolated or comparatively isolated elevation rising 1,000 meters or more from the sea floor and of limited extent across the summit. [17]

SEAMOUNT. An elevation of the sea floor having a nearly equidimensional plan less than 60 nautical miles across the summit. [4]

SEAMOUNT CHAIN. Three or more seamounts in a line and with bases separated by a relatively flat sea floor. [4]

SEAMOUNT GROUP. Three or more seamounts not in a line and with bases separated by a relatively flat sea floor. [4]

SEAMOUNT RANGE. Three or more seamounts having connected bases and aligned along a ridge or rise. [4]

SEA STATE (OR STATE OF THE SEA). The numerical or written description of ocean surface roughness. For more precise usage sea state may be defined as the average height of the highest one-third of the waves observed in the wave train, referred to a numerical code which covers an increasing range of such heights as indicated by WMO Code 75 table below:

Code	Wave height (feet)
0	0
1	0[a]
2	0[a]-1°
3	1°-4
4	4-8
5	8-13
6	13-20
7	20-30
8	30-45
9	Over 45

[12]

SEA WALL. A structure separating land and water areas, primarily designed to prevent erosion and other damage due to wave action. See also Bulkhead. [14]

An embankment or wall for protection against waves or tidal action along a shore or water front. [17]

SEAWARD. Away from the land; toward the sea. [17]

SEAWARD BOUNDARY. Limits of any area or zone offshore form the mean low, or mean lower low water line and established by an act of the U.S. Congress, or agreed to by treaty. See Mean Low Water Line. [25]

SEAWARD LIMITS OF INLAND WATERS. The beginning of the marginal sea; that is, at the line of ordinary low water along a straight or slightly curving coast, and a headland-to-headland line in the case of indentations that fall into the category of true bays. Where straight baselines are permissible, such lines mark the seaward limits of inland waters. [3]

SECONDARY AID. A major light of less strategic importance and usually less intensity than a primary light; usually located in bays and at entrances to harbors. [37]

SECONDARY LIGHT. A major light, other than a primary seacoast light, established at harbor entrances and other locations where high intensity and reliability are required. [1]

SECONDARY PHASE FACTOR CORRECTION. A correction for additional time (or phase delay) for transmission of a low frequency signal over an all seawater path when the signal transit time is based on the free-space velocity. The Loran-C lattices as tabulated in tables or overprinted on the nautical chart normally include compensation for secondary phase factor. [1]

SECULAR CHANGE. An increase or decrease of intensity and/or change of direction of the total magnetic field over a period of many years. [17]

SECURITY ZONE. "Security zone" as used in this part, means all areas of land, water, or land and water, which are so designated by the Captain of the Port for such time as he deems necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States. (EO 11249, 30 FR 13001, October 13, 1965) [2]

SEDIMENT(S), BOTTOM. In general all sedimentary material regardless of origin found on or in the submarine bottom, including ballast or other material dumped into the sea by man. More specifically it is limited to unconsolidated mineral and organic material forming the sea bottom, not including coral reefs or bedrocks. [17]

SEICHE. A stationary wave usually caused by strong winds and/or changes in barometric pressure. It is found in lakes, semi-enclosed bodies of water, and in areas of the open ocean. [7]

SEISMIC SEA WAVE. See Tsunami. [17]

SELECTIVE DUMP (ISO). The dumping of the contents of one or more specified storage areas. [20]

A dump of a selected area of internal storage. [34]

SEMIDIURNAL. Having a period or cycle of approximately one-half of a tidal day. The predominant type of tide throughout the world is semidiurnal, with two high waters and two low waters each tidal day. The tidal current is said to be semidiurnal when there are two flood and two ebb periods each day. [7]

SEPARATION ZONE OR LINE. A zone or line separating traffic proceeding in one direction from traffic proceeding in another direction. A separation zone may also be used to separate a traffic lane from the adjacent inshore traffic zone. [19]

SEQUENCED RADIOBEACON. In U.S. waters, one of a group of up to six marine radiobeacons in the same geographical area, except those operating continuously, that transmit on a single

frequency. Each radiobeacon transmits for 1 minute out of each 6-minute period in sequence with the other beacons of the group. If less than six radiobeacons are assigned to a group, one or more of the beacons may transmit during two of the six 1-minute periods. The transmissions in sequence reduce station interference and undesirable retuning. [1]

SET. (1) (ISO) A finite or infinite number of objects of any kind, of entities, or of concepts, that have a given property or properties in common. (2) (ISO) To cause a counter to take the state corresponding to a specified number. (3) (ISO) To put all or part of a data processing device into a specified state. (4) See alphabetic character set and alphanumeric character set. [20]

(1) To place a storage device in a prescribed state. (2) To place a binary cell in the one state. (3) A collection of elements having some feature in common or which bear a certain relation to one another; e.g., all even numbers, geometrical figures, terms in a series, a group of irrational numbers, all positive even integers less than 100, may be a set or a subset. [34]

SETTING A BUOY. The act of placing a buoy on assigned position in the water. [37]

SEWAGE. "Sewage" means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body waste. [2]

SEXTANT. A double-reflecting instrument for measuring angles, primarily altitudes of celestial bodies. As originally used, the term applied only to instruments having an arc of 60°, a sixth of a circle, from which the instrument derived its name. Such an instrument had a range of 120°. In modern practice the term applies to a similar instrument, regardless of its range, very few modern instruments being sextants in the original sense. Thus, an octant, having a range of 90°; a quintant, having a range of 144°; and a quadrant, having a range of 180°, are all called sextants. A marine sextant is designed primarily for marine navigation. It may be either a clamp screw sextant or endless tangent screw sextant depending upon the means for controlling the position of the index arm and the vernier or micrometer drum. It may be either a vernier sextant or micrometer drum sextant depending upon the means used to provide precise readings. A periscope sextant is one designed to be used in conjunction with the periscope of a submarine. A periscope sextant is intended primarily for use in hydrographic surveying. [1]

SHADED RELIEF. A cartographic technique that provides an apparent three-dimensional configuration of the terrain on maps and charts by the use of graded shadows that would be cast by high ground if light were shining from the northwest. Shaded relief is usually used in combination with contours. [1]

SHALLOW WATER. Commonly, water of such a depth that surface waves are noticeably affected by bottom topography. It is customary to consider water of depths less than half the surface wave length as shallow water. [17]

SHEET CORNER VALUES. Coordinates of the map; sheet corners in terms of graticule values or grid values. [21]

SHELF; CONTINENTAL SHELF; ISLAND SHELF; INSULAR SHELF. A zone adjacent to a continent (or around an island) and extending from the low water line to a depth at which there is usually a marked increase of slope towards oceanic depths. [18]

SHELF EDGE. A line along which there is a marked increase of slope at the outer margin of a continental shelf or an island shelf. (For charting purposes the 100-fathom depth contour is normally accepted as the shelf edge; the actual depth usually is less but may be more.) [4]

SHINGLE. Rounded, often flat waterworn rock fragments larger than approximately 16 millimeters. [17]

SHIPPING LANE. A term used to indicate the general flow of merchant shipping between two departure/terminal areas. [13]

SHIPS' ROUTING. A publication of the International Maritime Organization (IMO) which describes the general provisions of ships' routing, traffic separation schemes, deep water routes and areas to be avoided, which have been adopted by IMO. All details of routing systems are promulgated through Notices to Mariners, together with their dates of implementation. Also details of routing systems are depicted on charts and are given in Sailing Directions. [1]

SHOAL. Shallow. [17]

An offshore hazard to navigation on which there is a depth of ten fathoms or twenty meters or less, composed of unconsolidated material, except coral or rock. See Reef. [17]

SHOALING. A bottom effect which describes the height of the waves, but not the direction. It can be divided into two parts which occur simultaneously. The one part has to do with the fact that waves become less dispersive close to shore; therefore, since the same energy can be carried by high waves of lesser height, this effect causes a gradual decrease in the wave height. In the other part, the waves slow down, the crests move closer together, and since the energy between crests remain relatively fixed, the waves can become higher near shore. These effects are evidenced in the initial decrease in height of the incoming wave, then an increase in height as the wave comes into shore. [12]

SHORAN. An electronic navigational system basically consisting of an interrogator-responsor at the mobile station and transponders at known fixed stations. The system is quite suitable for hydrographic surveying but its range is restricted to approximate line of sight distances. The term is derived from the words short range navigation. [17]

SHORE. That part of the land in immediate contact with a body of water including the area between high and low water lines. The term shore is usually used with reference to the body of water and coast with reference to the land, as the east coast of the United States is part of the western shore of Atlantic Ocean. The term shore usually refers to a narrow strip of land in immediate contact with any body of water, while coast refers to a general region in proximity to the sea. A shore bordering the sea may be called a seashore. See also Foreshore; Backshore. [1]

Same as tidelands. [3]

The zone over which the line of contact between land and sea migrates; the landward limit of effective wave action. Extends from the low-water mark inshore to the base of the cliff. [3]

SHOREFACE. The narrow zone seaward from the low tide shoreline, permanently covered by water, over which the beach sands and gravels actively oscillate with changing wave conditions. [1]

SHORELINE. The line of contact between the land and a body of water. On National Ocean Service nautical charts and surveys the shoreline approximates the mean high-water line. In National Ocean Service usage the term is considered synonymous with "coastline." See Mean High-Water Line. [3]

The intersection of the land with the water surface. The shoreline shown on charts represents the line of contact between the land and a selected water elevation. In areas affected by tidal fluctuations, this line of contact is usually the mean high water line. In confined coastal waters of diminished tidal influence, the mean water level line may be used. [1]

The line where shore and water meet. Although the terminology of coasts and shores is rather confused, shoreline and coastline are generally used as synonymous. [17]

Three basic shorelines are compiled on shoreline maps; natural, man-made, and apparent. While these shorelines are not susceptible to rigorous definition, conceptual meanings of each, as used within the Photogrammetry Branch, are given below. Confined coastal waters often show diminished tidal influence due to meteorological conditions and/or restricted tidal drainage. Where significant tidal anomalies occur, the mean water line may be mapped instead of the usual mean high water line. In addition to the above shoreline, the apparent shoreline is sometimes mapped. The apparent shoreline will be mapped only if it differs in position from the fast shoreline by more than 1 mm at manuscript scale. When proximities less than this occur, the fast shoreline should be compiled with the note "Fringe of vegetation" placed along the shore. When a natural or man-made shoreline cannot be delineated with reasonable certainty, an approximate shoreline should be compiled. In cases where this line may be confused with an approximate limit line, a note clearly identifying the line as an approximate shoreline must be used. The use of approximate shorelines should be avoided if possible and considered only as a last resort when all other attempts to identify and compile the actual shoreline fail. A shoreline may occasionally show certain characteristics that may be of landmark value, such as an unusually rocky shore, a cliff, or other prominent feature. These distinguishing features should be pointed out by note and/or symbol. However, they should not be considered shoreline classifications, but rather characteristics of natural or man-made shore. In general, the resolution of shoreline classification, that is, the shortest length of shoreline requiring classification is 5 mm at the manuscript scale. For example, 4 mm of seawall imbedded in an otherwise natural shoreline need not be differentiated. However, if this seawall is of special value in the use of the chart, then it should be delineated. [31]

SHORELINE MAPS. Shoreline maps are the graphic representation of planetable and photogrammetric surveys which currently comprise the "T" and "TP" series maps of NOS. The maps contain graphic data relating to the shoreline, alongshore natural and man-made features, and a narrow zone of natural and man-made features inland from the shoreline. The original sources of a shoreline map are ground survey data and photographs. Utilizing these sources, photogrammetric map compilation techniques, and instruments, cartographers generate shoreline maps, overlays, and associated data. The data are primarily generated to support nautical chart maintenance, new nautical chart construction, and hydrographic survey operations. [32]

SHORT RANGE SYSTEMS. Those radionavigation systems limited in their positioning capability to coastal regions, or those systems limited to making landfall. Radar and the radio direction finder are examples. See also Medium Range Systems. [1]

SIDE SCAN SONAR. A form of "active" sonar in which fixed acoustic beams are directed into the water perpendicularly to the direction of travel to "scan" the bottom and generate a graphic record of the bottom configuration. ("Active" sonars are those which transmit intermittent pulses of acoustic energy and then listen for echoes during the intervals between pulses. This process is sometimes referred to as "echo ranging.") [40]

SIGNIFICANT. The term "Significant" applies to a condition or situation that could have a material consequence for the chart user. A significant error, for example, could lead to an erroneous, even dangerous use of the chart. [31]

SILK SCREEN PRINTING. A mechanized stencil printing process in which a fine screen of silk, or specially treated wire, is covered by a negative stencil blocking out the non-printing areas. Ink is squeezed through the open areas on to the printed surface. [21]

SILL. On the sea floor, the low part of a gap or saddle separating basins. See also Dock Sill. [1]

SILL DEPTH. The greatest depth over a sill. [4]

SINGLE STATION RANGE LIGHT. A direction light bounded by other sectors of different characteristics which define its margins with small angles of uncertainty. Most commonly the bounding sectors are of different colors (red and green). [1]

SINK, SINKHOLE. A depression which has subsurface drainage only, through natural holes and caverns in limestone or by seepage into a lower-lying water table. [4]

SKEG. A wood or metal "fin" that extends beneath the keel at the stern of small craft to increase the stability of the craft with respect to yawing; it may extend abaft the keel and protect the propeller from the ground. [15]

SKELETON TOWER. A tower, usually of steel, constructed of heavy corner members and various horizontal and diagonal bracing members. [37]

SKYWAVE. A radio wave that is propagated by way of the ionosphere. Also called ionospheric wave. [1]

SKYWAVE CORRECTION. The correction to be applied to the time difference reading of signals received via the ionosphere to convert it to the equivalent groundwave reading. The correction for a particular place is established on the basis of an average height of the ionosphere. [1]

SLACK WATER (SLACK). The state of a tidal current when its speed if near zero, especially the moment when a reversing current changes direction and its speed is zero. The term also is applied to the entire period of low speed near the time of turning of the current when it is too weak to be of any practical importance in navigation. The relation of the time of slack water to the tidal phases varies in the different localities. For a perfect standing tidal wave, slack water occurs at the time of high and of low water, while for a perfect progressive tidal wave, slack water occurs midway between high and low water. [7]

SLAVE STATION. In a radio navigation system, the transmitting station controlled or triggered by the signal received from the master station. Often shortened to slave. [17]

SLIP. A berthing space between two piers. Also called Dock. [1]

SLIPWAY. A structure in a shipyard on which vessels are constructed so that when finished they may be slid into the water. [35]

SLOPE. On the sea floor, the slope seaward from the shelf edge to the beginning of a continental or insular rise or the point where there is a general reduction in slope. [1]

SLOUGH. A minor marshland or tidal waterway which usually connects other tidal areas; often more or less equivalent to a bayou. Quagmire, swamp, miry place. [17]

A minor marshland or tidal waterway which usually connects other tidal areas; often more or less equivalent to a bayou; occasionally applied to the sea level portion of a creek on the U.S. West Coast. [1]

SLUE. A slough, or swamp. [4]

SLUICE. Sliding gate or other contrivance for changing the level of a body of water by controlling flow into or out of it. [17]

SMALL-CRAFT NAUTICAL CHARTS. These charts are published by the U.S. National Ocean Service at scales from 1:10,000 to 1:80,000 and are designed for easy reference and plotting in limited spaces. In some areas these charts represent the only chart coverage for all marine users. They portray regular nautical chart detail and other specific details of special interest to small-craft operators, such as enlargements of harbors; tide, current, and weather data; rules-of-the-road information; locations of marine facilities; anchorages; courses; and distances. See Folio Charts, Area Charts, Route Charts, Modified Route Charts, Recreational Charts, and Canoe Charts. [29]

SMALL-SCALE CHART. For purposes of distinguishing and generalizing topographic line data and other selected data within the AIS data base, any NOS nautical chart of a smaller scale than 1:105,000. [29]

SMALL-SCALE (SURVEY OR CHART). A relative term, but generally one covering a large area on the ground. In National Ocean Service usage, a scale of 1:100,000 (1 inch on survey or chart = 100,000 inches on the ground) or smaller would fall in this classification. See Large-Scale (Survey or Chart). [3]

SMOOTH SHEET. Final plot of field control and hydrographic development such as soundings, fathom curves, bottom samples, and obstructions, dangers, and aids to navigation resulting from a hydrographic survey. [25]

SNAG. A tree or branch embedded in a river or lake bottom and not visible on the surface, forming thereby a hazard to boats. [17]

An unidentified submerged object that is not considered to be the remains of a submerged wreck and is not considered to be a danger to surface navigation shall be charted with a 1 mm circle and labeled "Snag." If a least depth over the debris has been determined by a leadline sounding or similar precise surveying method, it will replace the 1 mm circle but will still be labeled "Snag." [29]

SOFTWARE. (1) Programs, procedures, rules, and any associated documentation pertaining to the operation of a system. (2) Contrast with hardware. [20]

Various programming aids that are frequently supplied by the manufacturers to facilitate the purchaser's efficient operation of the equipment. Such software items include various assemblers, generators, subroutine libraries, compilers, operating systems, and industry-application programs. [34]

A set of programs, procedures, and possibly associated documentation concerned with the operation of a data processing system. For example compilers, library routines, manuals, circuit diagrams. Contrast with "hardware." Necessary for computer operation since computers are designed to be programmed and therefore do not have any practically useful function without appropriate software. [22]

SOLID STATE COMPONENT. A component whose operation depends on the control of electric or magnetic phenomena in solids, e.g., a transistor, crystal diode, ferrite core. [9]

SONOBUOY. A buoy with equipment for automatically transmitting a radio signal when triggered by an underwater sound signal. Also called sono-radio buoy, radio sonobuoy. [17]

SONIC DEPTH FINDER. A direct-reading instrument which determines the depth of water by measuring the time interval between the emission of a sound and the return of its echo from the bottom. A similar instrument utilizing signals above audible range is called an ultrasonic depth finder. Both instruments are also called echo sounders. [1]

SORT. (1) The operation of sorting. (2) (ISO) To segregate items into groups according to specified criteria. Sorting involves ordering, but need not involve sequencing for the groups may be arranged in an arbitrary order. (3) To arrange a set of items according to keys which are used as a basis for determining the sequence of the items, e.g., to arrange the records of a personnel file into alphabetical sequence by using the employee names as sort keys. [20]

(1) To arrange items of information according to rules dependent upon a key or field contained in the items. (2) A systems program which arranges a file of items in a logical sequence according to a designated key word contained within each item (e.g., the arranging of items according to date, code number, etc.). [34]

To segregate items into groups according to some definite rules. Same as "order." Often done by a program, routine, or subroutine. [22]

SORTER. (1) (ISO) A device that deposits punched cards in pockets selected according to the hole patterns in the cards. (2) A person, device, or computer routine that sorts. [20]

A machine which puts items of information into a particular order; e.g., it will determine whether A is greater than, equal to or less than B and sort or order accordingly. Synonymous with (sequencer). [24]

SOUND. (1) A relatively long arm of the sea or ocean forming a channel between an island and a mainland or connecting two larger bodies of water, as a sea and the ocean, or two parts of the same body but usually wider and more extensive than a strait. The term has been applied to many features which do not fit the accepted definition. Many are very large bodies of water, such as Mississippi Sound and Prince William Sound, others are mere salt water ponds or small passages between islands. [1]

SOUND BUOY. A buoy equipped with either a gong, bell, whistle, or electronic horn. Bells and gongs on buoys are sounded by tappers that hang from the tower and swing as the buoys roll in the sea. Bell buoys produce a sound of only one tone; gong buoys produce several tones. Whistle buoys make a loud moaning sound caused by the rising and falling motions of the buoy in the sea. A buoy equipped with an electronic horn, a horn buoy, will produce a pure tone at regular intervals and will operate continuously regardless of the sea state. A lighted sound buoy has the same general configuration as a lighted buoy but is equipped with a sound signal. Unlighted sound buoys have the same general appearance as light buoys but are not equipped with any light apparatus. [1]

SOUNDING. Measured or charted depth of water, or the measurement of such depth. A no-bottom sounding is one in which the bottom is not reached. A vessel is said to be on soundings when it is navigating primarily by means of the information obtained by successive measurements of the depth of the water, or is in an area where this can be done. In other areas a vessel is said to be off soundings. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation is called a danger sounding. See also Echo Sounding; Line of Soundings. [1]

SOUNDING, DANGER. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation. [17]

SOUNDING DATUM. Same as chart datum. [3]

SOUNDING(S), DETACHED. Those soundings, including least depths on shoals, whose positions were accurately located. See Position, Detached. [17]

SOUNDING, DOUBTFUL. A depth shown on a chart over a shoal, a rock, etc., that may be less than that indicated. [17]

SOUNDING, HAND LEAD. Sounding with hand lead. Hand lead soundings are usually taken from a slowly moving vessel. [17]

SOUNDING MACHINE. An instrument for measuring depth of water, consisting essentially of a reel of wire to one end of which is attached a weight which carries a device for recording the depth. A crank or motor is provided for reeling in the wire. [1]

SOUNDING(S), MINUS. Soundings that reduce to height above the sounding datum (plane of reference) when corrected for height of tide. Minus soundings are shown on the smooth sheet preceded by a minus sign. [17]

SOUNDING(S), NO BOTTOM. Soundings where the bottom was not reached because the general depths were too great for the method of measurement. [17]

SOUNDING POLE. A thin graduated pole used for obtaining the water depth in shallow rivers, fairways, and so on, or to ascertain the exact depth above a pinnacle. It has a length of about 10 ft. and its lower end is fitted with an iron cap. [36]

SOUNDING(S), ZERO. Soundings that reduce to heights above the sounding datum but shown on the smooth sheet as zero soundings regardless of height. A practice now discontinued. See Sounding(s), Minus. [17]

SOUND SIGNAL. A sound transmitted in order to convey information as a fog signal. The term sound signal is frequently used to describe the apparatus generating the sound. This use is deprecated. [1]

SOUND VELOCITY. The rate of motion at which sound energy moves through a medium. The velocity of sound in sea water is a function of temperature, salinity, and the changes in pressure associated with changes in depth. An increase in any of these factors tends to increase the velocity. [17]

SOURCE MATERIAL. Data of any type required for the production of MC&G products including, but not limited to, ground control, aerial and terrestrial photographs, sketches, maps, and charts; topographic, hydrographic, hypsographic, magnetic, geodetic, oceanographic, and meteorological information; intelligence documents and written reports pertaining to natural and man-made features of the area to be mapped or charted. [10]

SPECIAL PURPOSE BUOY. A buoy having no lateral significance used to indicate a special meaning to the mariner which must be determined from appropriate nautical documents. [37]

SPHEROID. An ellipsoid; a figure resembling a sphere. Also called ellipsoid or ellipsoid of revolution, from the fact that it can be formed by revolving an ellipse about one of its axes. If the shorter axis is used as the axis of revolution, an oblate spheroid results, and if the longer axis is used, a prolate spheroid results. The earth is approximately an oblate spheroid. [1]

SPIKE. Sharp deviation from a line, caused by erroneous data. [22]

SPIRE. A label on a nautical chart which indicates a pointed structure extending above a building. The spire is seldom less than two-thirds of the entire height and its lines are rarely broken by stages or other features. The term is not applied to short pyramid-shaped structure rising from a tower or belfry. [1]

SPIT. A small tongue of land or a long narrow shoal (usually sand) extending from the shore into a body of water. Generally the tongue of land continues in a long narrow shoal for some distance from the shore. [1]

SPLIT. An area between drag strips not covered by the drag. [6]

SPOIL. Mud, sand, silt or other deposit obtained from the bottom of a channel of harbor by dredging. [17]

SPOIL AREA. Area for the purpose of depositing dredged material, usually near and parallel to dredged channels. Spoil areas are usually a hazard to navigation and navigators of even the smallest craft should avoid crossing these areas. Spoil areas are shown on nautical charts. See also Disposal Area; Dumping Grounds; Dump Site. Also called spoil ground. [1]

SPOIL BANKS. Submerged accumulations of dumped material dredged from channels or harbours. [17]

SPOIL GROUND. See Spoil Area. [1]

SPOT ELEVATION. A point on a map or chart whose height above a specified datum is noted, usually by a dot or a small sawbuck and elevation value. [1]

SPRING. A place where water issues naturally from the rock or soil upon the land or into a body of surface water. [4]

SPRING TIDES OR TIDAL CURRENTS. Tides of increased range or tidal currents of increased speed occurring semimonthly as the result of the Moon being new or full. The spring range (Sg) of tide is the average range occurring at the time of spring tides and is most conveniently computed from the harmonic constants. It is larger than the mean range where the type of tide is either semidiurnal or mixed, and is of no practical significance where the type of tide is predominantly diurnal. The average height of the high waters of the spring tides is called spring high water or mean high water springs (MHWS) and the average height of the corresponding low waters is called spring low water or mean low water springs (MLWS). [7]

SPUR. A subordinate elevation, ridge or rise projecting outward from a larger feature. [17]

STABLE-BASE FILM. A particular type of film having high stability in regard to shrinkage and stretching. (Suitable for aerial mapping photography and map production. Usually referred to by its commercial name.) [10]

STACK. A label on a nautical chart which indicates a tall smokestack or chimney. The term is used when the stack is more prominent as a landmark than the accompanying buildings. [1]

STAKE. An elongated wood or metal pole embedded in the bottom to serve as a marker or support for fish nets. A stake plotted on a hydrographic survey is assumed to be wooden unless otherwise annotated. [40]

STANDARD PARALLEL. (1) A parallel of latitude which is used as a control line in the computation of a map projection. (2) A parallel of latitude on a map or chart along which the scale is as stated for that map or chart. [1]

STANDARD TYPE BUOY. The general classification of all lighted and unlighted buoys in U.S. waters built to modern (1962) specifications. [1]

STAND OF TIDE. Sometimes called a platform tide. An interval at high or low water when there is no sensible change in the height of the tide. The water level is stationary at high and low water for only an instant, but the change in level near these times is so slow that it is not usually perceptible. In general, the duration of the apparent stand will depend upon the range of tide, being longer for a small range than for a large range, but where there is a tendency for a double tide the stand may last for several hours even with a large range of tide. [7]

STANDPIPE. A label on a nautical chart which indicates a tall cylindrical structure, in a waterworks system, the height of which is several times the diameter. [1]

STARBOARD. The right side of a craft, facing forward. The opposite is port. [1]

STATE COORDINATE SYSTEMS. The plane-rectangular coordinate systems established by the U.S. Coast and Geodetic Survey, one for each State in the Union, for use in defining positions of geodetic stations in terms of plane-rectangular (x and y) coordinates. Each State is covered by one or more zones, over each of which is placed a grid imposed upon a conformal map projection. The relationship between the grid and the map projection is established by mathematical analysis. Zones of limited east-west dimension and indefinite north-south extent have the transverse Mercator map projection as the base for the State coordinate system; while zones for which the above order of magnitude is reversed use the Lambert conformal conic map projection with two standard parallels. [8]

STATIC DUMP (ISO). Dumping that is performed at a particular point in time with respect to a machine, often at the end of a run, and usually under the control of the computer operator or a supervisory program. [20]

A dump that is performed at a particular point in time with respect to a machine run, frequently at the end of a run. [34]

STATION (SURVEYING). A definite point on the Earth whose location has been determined by surveying methods. It may or may not be marked on the ground. A station usually is defined by the addition of a term which describes its origin or purpose. Usually marked on the ground by a monument of special construction, or by a natural or artificial structure. [10]

STATION BUOY. An unlighted buoy set near a lightship or an important buoy as a reference point should the primary aid be moved from its assigned position. [37]

An unlighted buoy established in the vicinity of a lightship or an important lighted buoy as a reference point in case the lightship or buoy should be dragged off station. Also called watch buoy. [1]

STATION, RECOVERABLE. A station artificially marked by well defined natural or artificial objects, whose geographic position has been accurately determined and which has been described. [17]

STATION, REFERENCE. A place where tide or tidal current constants have been determined from observations, and which is used as a standard for the comparison of simultaneous observations at a subordinate station. It is also a place for which independent daily predictions are given in the tide or tidal current tables, from which corresponding predictions are obtained for other locations by means of differences or factors. Also called standard station and standard port (British terminology). [17]

STATION, TIDE. A place where tidal observations are obtained. It is a primary tide station when continuous observations are available for a sufficient number of years to determine the characteristic tide features for the locality. A secondary tide station is operated during a short period of time to obtain data for a specific purpose. [17]

STATUTE MILE. A unit of distance equal to 5,280 feet. This mile is generally used on land, and is sometimes called land mile. It is commonly used to express navigational distances by navigators of river and lake vessels, particularly those navigating the Great Lakes of North America. [1]

STEREOTRIANGULATION. Phototriangulation using a stereoscopic plotting instrument. Also called bridging, instrument phototriangulation, multiplex triangulation, triangulation, and stereotriangulation. Because most stereotriangulation is done using aerial photographs, the above definition is often thought of as applying to aerotriangulation in particular rather than to phototriangulation in general. [39]

STICK-UP. Adhesive-backed or wax-backed film or paper on which map names, symbols, descriptive terms, etc., have been printed for application in map production. [21]

STORAGE CAPACITY (ISO). The amount of data that can be contained in a storage device measured in binary digits, bytes, characters, words, or other units of data. [20]

Number of units of data that may be stored in a given storage device at one time. It is variously expressed in terms of bits, characters, or words. [34]

STORAGE DEVICE (ISO). A functional unit into which data can be placed, in which they can be retained, and from which they can be retrieved. [20]

A device in which data can be inserted, retained, and then retrieved for later use. [34]

STORAGE PROTECTION (ISO). Limitation of access to a storage device, or to one or more storage locations, by preventing writing or reading or both. Synonymous with memory protection. [20]

Continued existence of a stored program requires protection from all contemporary programs and, in particular, that each stored program have inviolate storage areas. This is accomplished by independently establishing reserved areas in each storage module and inhibiting a program of reading, writing, or transferring to a location that is not within its reserved areas. Every instruction that references the central store has the final address checked to ensure that it falls within a permissible area. Storage protection allows several programs to reside in core storage at the same time while one is being executed. It also allows transfer of data from peripheral equipment to memory while other programs already are in memory. Storage protection eliminates danger that one program would inadvertently be placed over, and thereby destroy, another program. [34]

STORM SURGE. A departure from a normal elevation of the sea due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. Reduced atmospheric pressure often contributes to the departure in height during hurricanes. It is potentially catastrophic, especially in deltaic regions with onshore winds at the time of high tide and extreme wind wave heights. [7]

STRAIT. A relatively narrow waterway, usually narrower and less extensive than a sound, connecting two larger bodies of water. [1]

STRAND. The portion of the seashore between high and low water line. [17]

To run aground. The term "strand" usually refers to a serious grounding, while the term "ground" refers to any grounding, however slight. [1]

STRANDED AND SUNKEN. These terms apply exclusively to items that once possessed the ability to float but which are now resting on the bottom. Stranded items project above the sounding datum. Sunken items do not project above the sounding datum. These terms apply most often to wrecks. Masts, funnels, and other extensions of wreck superstructure should be disregarded when applying the above definitions; these features may be above the sounding datum and still have the wreck classified as "sunken." [31]

STRANDING. The destruction or loss of a vessel by its being sunk or broken up by the violence of the sea or by its striking or stranding upon a rock, shoal, or the like. The term "stranding" refers most particularly to the driving or running aground of a vessel. It may be either accidental or voluntary. Voluntary stranding takes place where the ship is run aground either to preserve her from a worse fate, or for some fraudulent purpose. In marine insurance a "touch and go" is not considered a stranding. In order to constitute a stranding the ship must be stationary for a certain length of time. [36]

STRATH (SELDOM USED). A broad, elongated depression, with relatively steep walls, located on a continental shelf. The longitudinal profile of the floor is gently undulating with the greatest depths often found in the inshore portion. [4]

STREAM. Any river, brook, rivulet or course of running water.

A steady current in the sea or in a river, especially the middle or most rapid part of a tide or current. [17]

STREAM CHANNEL. The bed where a natural stream of water runs; the trench or depression washed in the surface of the earth by running water; a wash, arroyo or coulee. [4]

STREAM MODE (DIGITIZING). Mode of digitizer operation for line digitizing. [22]

STRIPPING FILM. A film which has the emulsion coated on an extremely thin membrane which is in turn supported on a normal-thickness film base. The emulsion and the membrane can be stripped (separated) from the base after exposure and processing. The thin image so obtained can be mounted face down on a new support for lateral image reversal or used for combining with, or inserting in, other image elements. [28]

STROBE LIGHT. Many charted features are marked with ultrabright flashing lights of extremely short duration. These bright flashes are produced by a strobe light device usually a xenon gas condenser-discharge flash lamp or flash tube. Xenon flashtubes are unique light sources capable of firing extremely powerful flash. The flash is almost similar to the spectral distribution of light of the sun, which ranges from ultraviolet to infrared regions. The duration of the flash is controlled from some microseconds up to scores of milliseconds. Strobe lights are used on certain U.S. Coast Guard (USCG) maintained aids to navigation and on potential aero hazards such as stacks, towers, and buildings. The terms "Flick" and "Flash Tube" as used in USCG Notice to Mariners are considered to have strobe light characteristics for the purpose of nautical chart labeling. Aids published in the Notices to Mariners and Light Lists as well as landmarks with the above characteristics are identified on nautical charts with the label "Strobe" incorporated within the label of the particular feature. [29]

STRUCTURE. The term "structure" shall include, without limitation, any pier, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction. [2]

STUD REGISTER SYSTEM (USA: PRE-PUNCH REGISTER SYSTEM). A method in which a pattern of precisely located holes is punched in the margin of map or chart material (such as film or plastic sheet) prior to use. Register studs are placed through the holes in a component sheet and the other components are overlaid so that studs pass through the corresponding holes, assuring exact register. [21]

STYLUS (ISO). A pointer that is operated by placing it in a display space or a tablet, e.g., a light pen, sonic pen, voltage pencil. [20]

A pointed instrument, like a pen, which is used to indicate positions or trace lines on a digital tablet or digitizer. [22]

SUB-FEATURE. (1) An individual member of a group or category of cartographic features. (2) An individual string of data belonging to the digital description of any sort of cartographic feature. [22]

SUB-FEATURE CODE. Same as "feature code," but for a sub-feature. Often forming part of the overall feature code. May be a sequence number attached to a sub-feature. [22]

SUBMARINE CABLE. An insulated, waterproofed wire or bundle of wires for carrying an electric current under water. Such a cable is placed on or near the bottom. [1]

SUBMARINE VALLEY (ALSO CALLED SEAVALLEY). A depression in the sea bottom of broad valley form without the steep side slopes which characterize a canyon. [3]

SUBMERGED. Under water; not showing above water. The opposite is uncovered. [17]

This term applies to objects and features that never possessed the ability to float and are now attached to or resting on the bottom. All items in this category, except rocks, reefs, and rock or reef formations, are submerged if they are totally below the shoreline datum. [31]

SUBMERGED LANDS. Lands covered by water at any stage of the tide, as distinguished from tidelands which are attached to the mainland or an island and cover and uncover with the tide. Tidelands presuppose a high-water line as the upper boundary, submerged lands do not. [3]

SUBMERGED LAND ACT. See Public Law 31. [29]

SUBMERGED PRODUCTION WELL. An oil or gas well that is a seabed installation only, i.e., the installation does not include a permanent production platform. See also Wellhead. [1]

SUBMERGED ROCK. A rock covered at the chart sounding datum and considered to be potentially dangerous to navigation. See also Bare Rock; Rock Awash. [1]

SUBORDINATE CURRENT STATION. (1) A current station from which a relatively short series of observations is reduced by comparison with simultaneous observations from a control current station. (2) A station listed in the Tidal Current Tables for which predictions are to be obtained by means of differences and ratios applied to the full predictions at a reference station. See Current Station; Reference Station. [7]

SUBPROGRAM. A part of a larger program which can be converted into machine language independently. [24]

SUBROUTINE. (1) (ISO) A sequenced set of statements that may be used in one or more computer programs and at one or more points in a computer program. (2) A routine that can be part of another routine. [20]

A program that defines desired operations and which may be included in another program to produce the desired operations. A subroutine can be arranged so that control may be transferred to it from a master routine and so that, at the conclusion of the subroutine, control

reverts to the master routine. Such a subroutine is usually called a closed subroutine. A single routine may simultaneously be both a subroutine with respect to another routine and a master routine with respect to a third. Usually control is transferred to a single subroutine from more than one place in the master routine, and the reason for using the subroutine is to avoid having to repeat the same sequence of instructions in different places in the master routine. [34]

A routine that can be part of another routine. [22]

(1) The set of instructions necessary to direct the computer to carry out a well-defined mathematical or logical operation. (2) A subunit of a routine. A subroutine is often written in relative or symbolic coding even when the routine to which it belongs is not. (3) A portion of a routine that causes a computer to carry out a well-defined mathematical or logical operation. (4) A routine which is arranged so that control may be transferred to it from a master routine and so that, at the conclusion of the subroutine, control reverts to the master routine. Such a subroutine is usually called a closed subroutine. (5) A single routine may simultaneously be both a subroutine with respect to another routine and a master routine with respect to a third. Usually control is transferred to a single subroutine from more than one place in the master routine and the reason for using the subroutine is to avoid having to repeat the same sequence of instructions in different places in the master routine. Clarified by (routine). [24]

SUMMIT. The highest point, part of elevation; top or apex. [17]

SUNKEN ROCK. A rock potentially dangerous to surface navigation, the summit of which is below the lower limit of the zone for a rock awash. [17]

SUPER-BUOY. A very large buoy, generally more than 5 meters in diameter. Its large size renders a super-buoy a potential hazard even to large vessels. The three principal types of super-buoy are: large navigational buoy, offshore tanker loading/discharge buoy (or single point mooring), and the oceanographic data acquisition systems (ODAS) buoy. [1]

SUPERVISORY PROGRAM (ISO). A computer program, usually part of an operating system, that controls the execution of other computer programs and regulates the flow of work in a data processing system. Synonymous with executive program, supervisor. [20]

Computer programs that have the primary function of scheduling, allocating, and controlling system resources rather than processing data to produce results. [34]

SUPERVISORY ROUTINE (ISO). A routine, usually part of an operating system, that controls the execution of other routines and regulates the flow of work in a data processing system. Synonymous with executive routine, supervisor. [20]

SURVEY. (1) The act or operation of making measurements for determining the relative positions of points on, above, or beneath the earth's surface. (2) The results of operations as in definition 1. (3) An organization for making surveys. See also Hydrographic Survey. [1]

SURVEY, HYDROGRAPHIC. (1) A survey that has as its principal purpose the determination of geometric and dynamic characteristics of bodies of water. A hydrographic survey may consist of the determination of one or several of the following classes of data: depth of water and configuration of bottom; velocities of currents; heights and times of tides and water stages; location of fixed objects for purposes of surveying and navigation. (2) A record of a survey, at a given date, of a water-covered region, with particular reference to the relief of the bottom as shown by soundings and depth contours.

The hydrographic survey is the authority for all data on features below the plane of high water (including the names of hydrographic features.) [39]

SURVEYING, GEODETIC. That branch of the art of surveying in which account is taken of the figure and size of the earth. Also called geodetic engineering.
In geodetic surveying, prescribed precision and accuracy of results are obtained through the use of special instruments and field methods, and formulas based on the geometry of a mathematical figure approximating the earth in form and size. [8]

SURVEY, TOPOGRAPHIC. A survey which has for its major purpose the determination of the configuration (RELIEF) of the surface of the earth and the location of natural and artificial objects thereon. [17]

SURVEY, WIRE-DRAG. A hydrographic survey made utilizing a wire drag. In areas of rocky bottom or where submerged obstacles such as wrecks are present, a wire-drag survey represents the most practical way of making sure that all obstructions or dangers have been found and least depths over them obtained. Also called wire-drag sweep. [17]

SUSPENSION BRIDGE. A bridge suspended from chains or cables which are anchored at either end and supported by towers at regular intervals.

SWAMP. A track of stillwater abounding in certain species of trees and course grass or boggy protuberances; a track of wet, spongy land, saturated, but not usually covered with water; a boggy marshland and stream; a slough. [4]

SWASH. A narrow channel or sound within a sand bank, or between a sand bank and the shore. Also called swashway.

A bar over which the sea washes.

The rush of water up onto a beach following the breaking of a wave. [17]

SWASH CHANNEL. (1) On the open shore, a channel cut by flowing water in its return to the parent body (e.g., a rip channel). (2) A secondary channel passing through or shoreward of an inlet or river bar. [14]

SWEEP. To drag. Drag and sweep have nearly the same meanings. Drag refers particularly to the location of obstructions, or the making sure that obstructions do not exist. Sweep may include, additionally, the removal of any obstruction located. [17]

An apparatus used in hydrographic surveys for the detection of rocky pinnacles, ledges, boulders, coral reefs. Also called wire drag. It consists of a horizontal bottom wire supported at intervals by adjustable upright cables suspended from buoys on the surface. These uprights can be lengthened or shortened for various required depths. They are kept in a nearly vertical position by means of weights attached to their lower ends. The end weights and buoys are larger than the intermediate and the towing gear is attached to them. The wire sweep is a modification of the drag for use in areas where the general depths are considerably greater than the depths to be verified and where few, if any, obstructions are believed to exist. [36]

SWEEPING. The process of towing a line or object below the surface, to determine whether an area is free from isolated submerged dangers to vessels and to determine the position of any such dangers that exist, or to determine the least depth of an area. The process of clearing an area or channel of mines or other dangers to navigation. [17]

SWING BRIDGE. A bridge that can be swung in a horizontal plane to allow tall vessels to pass.

SYMBOL. (1) (ISO) A conventional representation of a concept or a representation of a concept upon which agreement has been reached. (2) A representation of something by reason of relationship, association, or convention. [20]

(1) A simplified design representing a part in a schematic circuit diagram. (2) A letter representing a particular quantity in formulas. (3) In some systems a symbol consists of up to eight letters and digits beginning with a letter. Symbols are defined by their appearance as statement labels or equality symbols. The value of a symbol, defined as a label, is the value of the location counter at the time the label was encountered. The value of a symbol, defined by equality, is the value of the expression appearing on the right of the equal sign.

(4) A conventional representation of a concept or a representation of a concept upon which agreement has been reached. [34]

A diagram, design, letter, character, or abbreviation placed on maps, charts, and other graphics which by convention, usage, or reference to a legend is understood to stand for or represent a specific characteristic or feature. [10]

SYMBOLIC LOGIC (ISO). The discipline in which valid argument and operations are dealt with using an artificial language designated to avoid the ambiguities and logical inadequacies of natural languages. Synonymous with mathematical logic. [20]

(1) The study of formal logic and mathematics by means of a special written language that seeks to avoid the ambiguity and inadequacy of ordinary language. (2) The mathematical concepts, techniques, and languages as used in the foregoing definition, whatever their particular application or context. (Synonymous with mathematical logic, and related to logic.) [34]

SYSTEM. (1) (ISO) In data processing, a collection of people, machines, and methods organized to accomplish a set of specific functions. [20]

(1) An assembly of components united by some form of regulated interaction to form an organized whole. (2) A devised and designed regular or special method or plan or methodology or procedure. The organization of hardware, software, and people for cooperative operation to complete a set of tasks for desired purposes. [34]

SYSTEME INTERNATIONAL D'UNITES (SI). A self-consistent system of units adopted by the General Conference on Weights and Measures in 1960 as a modification of the then-existing metric system. The following units considered fundamental in SI:

Quantity	Base Unit	SI symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
temperature	kelvin	K
quantity of matter	mole	mol
luminous intensity	candela	cd

Supplementary Units:

plane angle	radian	rad
solid angle	steradian	sr

Some derived units with special names are:

frequency	hertz	Hz cycle/s
force	Newton	N kg.m/s²
work	Joule	J N.m
pressure	pascal	Pa N/m² [39]

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TABLEKNOLL. A seamount rising less than 500 fathoms from the sea floor and having a comparatively smooth, flat top with minor irregularities. [4]

TABLEMOUNT. A seamount rising more than 500 fathoms from sea floor and having a comparatively smooth, flat top with minor irregularities. [4]

TAGLINE. A line, either marked at equal intervals or run over a registered sheave, used in large-scale surveys to take equally spaced soundings at predetermined distances from the control stations. [17]

TAPE DRIVE. (1) (ISO) A mechanism for controlling the movement of magnetic tape. This mechanism is commonly used to move magnetic tape past a read head or write head, or to allow automatic rewinding. Synonymous with tape deck, tape transport. (2) (ISO) Deprecated term for tape unit. [20]

The mechanism that moves magnetic or paper tape past sensing and recording heads and is usually associated with data-processing equipment. (Synonymous with tape transport and feed, tape, and related to tape unit and magnetic-tape unit.) [34]

TAPE, MAGNETIC. A tape or ribbon of any material impregnated or coated with magnetic or other material on which information may be placed in the form of magnetically polarized spots. [24]

TEMPORARY STORAGE (ISO). In computer programming, storage locations reserved for intermediate results. Synonymous with working storage. [20]

Internal-storage locations reserved for intermediate or partial results. [34]

TERMINAL MORAINE. A moraine formed across the course of a glacier at its farthest advance, at or near a relatively stationary edge, or at places marking the termination of important glacial advances. [4]

TERRACE. On the sea floor, a relatively flat, horizontal or gently inclined surface, sometimes long and narrow, which is bounded by a steeper ascending slope on one side and by a steeper descending slope on the opposite side. [1]

TERRITORIAL LIMITS. The seaward limits of a littoral nation over which it has exclusive jurisdiction. See Marginal Sea. [3]

TERRITORIAL SEA (ALSO CALLED MARGINAL SEA, ADJACENT SEA, MARINE BELT, MARITIME BELT, AND 3-MILE LIMIT). The water area bordering a nation over which it has exclusive jurisdiction, except for the right of innocent passage of foreign vessels. It is a creation of international law, although no agreement has thus far been reached by the international community regarding its width. It extends seaward from the low-water

mark along a straight coast and from the seaward limits of inland waters where there are embayments. The United States has traditionally claimed 3 nautical miles as its width and has not recognized the claims of other countries to a wider belt. [3]

(a) With respect to the United States, "territorial seas" means the waters within the belt, 3 nautical miles wide, that is adjacent to its coast and seaward of the territorial sea baseline. (b) With respect to any foreign country, "territorial seas" means the waters within the belt that is adjacent to its coast and whose breadth and baseline are recognized by the United States. [2]

TERRITORIAL SEA BASELINE. "Territorial Sea Baseline" means the delimitation of the shoreward extent of the territorial seas of the United States drawn in accordance with principles, as recognized by the United States, of the Convention on the Territorial Sea and the Contiguous Zone, 15 U.S.T. 1606. [2]

TERRITORIAL WATERS. Includes the territorial sea (marginal sea) and the inland waters of a country (lakes, rivers, bays, etc.). Sometimes used as synonymous with Territorial Sea. [3]

THEODOLITE. A precise surveying instrument consisting of an alidade with a telescope mounted so that it can be rotated about a vertical axis; the amount of rotation is measured on an accurately graduated, stationary horizontal circle.

The alidade sometimes carries a graduated vertical circle against which rotation of the telescope in a vertical plane can be measured. There are two major categories of theodolites: direction theodolites, often referred to as direction instruments, and repeating theodolites. [39]

THOROFARE. This shortened form of thoroughfare has become standard for a natural waterway in marshy areas. It is the same type of feature as a slough or bayou. [1]

THREE-ARM PROTRACTOR. An instrument consisting essentially of a circle graduated in degrees, to which is attached one fixed arm and two arms pivoted at the center and provided with clamps so that they can be set an any angle to the fixed arm, within the limits of the instrument. It is used for finding a ship's position when the angles between three fixed and known points are measured. Also called station pointer. [1]

THREE-LEAGUE BOUNDARY. The maximum seaward boundary allowable for any state along the gulf coast under Public Law 31. [3]

THREE-MILE LIMIT. See Marginal Sea. [3]

TIDAL BASIN. A basin without a caisson or gate in which the level of water rises and falls with the tides. Also called open basin. See also Tidal Harbor; Non-Tidal Basin. [1]

TIDAL BORE. A tidal wave that propagates up a relatively shallow and sloping estuary or river in a solitary wave form. The leading edge presents an abrupt rise in level, frequently with continuous breaking and often immediately followed by several large undulations. An uncommon phenomenon, the tidal bore is usually associated with very large ranges in tide as well as wedge-shaped and rapidly shoaling entrances. Also called eagre, eager (for Tsientan, China bore), mascaret (French), pororoca (Brazilian), and bore. [7]

TIDAL CURRENT. A horizontal movement of the water caused by gravitational interactions between the sun, moon, and earth. The horizontal component of the particulate motion of a tidal wave. Part of the same general movement of the sea that is manifested in the vertical rise and fall, called tide. Called tidal stream in British terminology. See also Current; Tidal Wave; Tide. [1]

TIDAL CURRENT CHART DIAGRAMS. A series of 12 monthly diagrams to be used with the Tidal Current Charts. Each diagram contains lines that indicate the specific tidal current chart of each series to use, and speed factor to apply to that chart. [7]

TIDAL CURRENT CHARTS. (1) Charts on which tidal current data are depicted graphically. (2) Tidal current chart; as published by the National Ocean Service, part of a set of 12 charts which depict, by means of arrows and figures, the direction and velocity of the tidal current for each hour of the tidal cycle. The charts, which may be used for any year, present a comprehensive view of the tidal current movement in the respective waterways as a whole and also supply a means for readily determining for any time the direction and velocity of the current at various localities throughout the water area covered. The New York Harbor and Narragansett Bay tidal current charts are to be used with the annual tide tables. The other charts require the annual tidal current tables. [1]

TIDAL CURRENT TABLES. (1) Tables which give the predicted times of slack water and the predicted times and velocities of maximum current flood and ebb for each day of the year at a number of reference stations, together with time differences and velocity ratios for obtaining predictions at subordinate stations. (2) Tidal current tables; published annually by the National Ocean Service in two volumes; Atlantic Coast of North America; Pacific Coast of North America and Asia. [1]

TIDAL CYCLE. A complete set of tidal conditions as those occurring during a tidal day, lunar month, or Metonic cycle. [1]

TIDAL DATUM. Specific tide levels which are used as surfaces of reference for depth measurements in the sea and as a base for the determination of elevation on land. Many different datums have been used, particularly for leveling operations. Also called tidal datum plane. [10]

TIDAL DIFFERENCE. Difference in time or height of a high or low water at a subordinate station and at a reference station for which predictions are given in the tide tables. The difference applied according to sign to the prediction at the reference station gives the corresponding time or height for the subordinate station. [17]

TIDAL HARBOR. A harbor affected by the tides, in distinction from a harbor in which the water level is maintained by caissons or gates. See also Non-Tidal Basin. [1]

TIDAL FLAT. A marsh or sandy or muddy coastal flatland which is covered and uncovered by the rise and fall of the tide. [17]

TIDAL WATERS. All waters which flow and reflow under the influence of the tides. Arms of the sea, bays, creeks, coves, or rivers in which the tide ebbs and flows are properly denominated

tidal waters. The term tidal water is not limited to water which is salt, but embraces also so much of the water of fresh rivers as is propelled backward by the ingress and pressure of the tide. Also called tide waters. [36]

TIDAL WAVE. A shallow water wave caused by the gravitational interactions between the Sun, Moon, and Earth. Essentially, high water is the crest of a tidal wave and low water, trough. Tidal current is the horizontal component of the particulate motion, while tide is manifested by the vertical component. The observed tide and tidal current can be considered the result of the combination of several tidal waves, each of which may vary from nearly pure progressive to nearly pure standing and with differing periods, heights, phase relationships, and direction. [7]

TIDE. The periodic rise and fall of the water resulting from gravitational interactions between the sun, moon and earth. The vertical component of the particulate motion of a tidal wave. Although the accompanying horizontal movement of the water is part of the same phenomenon, it is preferable to designate this motion as tidal current. [1]

TIDE AND CURRENT GLOSSARY. A publication of the National Ocean Service which includes in addition to general tide and current terms those accepted definitions intrinsic to certain standard procedures of the Oceanographic Division of the National Ocean Survey. [1]

TIDE DIURNAL. A tide in which the tidal cycle consists of one high water and one low water each tidal day. In British terminology also called single day tide. [17]

TIDE GAGE. A device for measuring the height of tide. It may be simply a graduated staff in a sheltered location where visual observations can be made at any desired time; or it may consist of an elaborate recording instrument making a continuous graphic record of tide height against time. Such an instrument is usually actuated by a float in a pipe communicating with the sea through a small hole which filters out shorter waves. See Automatic Tide Gage. [10]

TIDE GATE. (1) A restricted passage through which water runs with great speed due to tidal action. (2) An opening through which water may flow freely when the tide sets in one direction, but which closes automatically and prevents the water from flowing in the other direction when the direction of flow is reversed. [1]

TIDELANDS. The land that is covered and uncovered by the daily rise and fall of the tide. More specifically, it is the zone between the mean high-water line and the mean low-water line along a coast, and is commonly known as the "shore" or "beach.". Referred to in legal decisions as between ordinary high-water mark and ordinary low-water mark. Tidelands presuppose a high-water line as the upper boundary. [3]

TIDE LOCK. A lock situated between a basin or canal and tidewater to maintain the water at a desired level as the height of the tide changes. Also called guard lock. [17]

TIDEMARK. (1) A high water mark left by tidal water. (2) The highest point reached by a high tide. (3) A mark placed to indicate the highest point reached by a high tide, or, occasionally, any specified state of tide. [1]

TIDE PREDICTING MACHINE. A mechanical analog machine especially designed to handle the great quantity of constituent summations required in the harmonic method. William Ferrel's Maxima and Minima Tide Predictor (Described in Manual of Tides, U.S. Coast and Geodetic Survey. Appendix 10, Report for 1883) was the first such machine used in the United States. Summing only 19 constituents, but giving direct readings of the predicted times and heights of the high and low waters, the Ferrel machine was used for the predictions of 1885 through 1914. A second machine, developed by Rollin A. Harris and E.G. Fischer and summing 37 constituents, was used for the predictions of 1912 through 1965 (described in Manual of Harmonic Analysis and Prediction of Tides by Paul Schuremen, U.S. Coast and Geodetic Survey Special Publication No. 98, 1958). Predictions are now prepared using an electronic digital computer. [7]

TIDE RACE. A very rapid tidal current through a comparatively narrow channel. Also called race. [1]

TIDE RIPS. Small waves formed on the surface of water by the meeting of opposing tidal currents or by a tidal current crossing an irregular bottom. Vertical oscillation, rather than progressive waves, is characteristic of tide rips. See also Rips. [1]

TIDE STAFF. A tide gage consisting of a vertical graduated staff from which the height of the tide can be read directly. It is called a fixed staff when secured in place so that it cannot be easily removed. A portable staff is one that is designed for removal from the water when not in use. For such a staff a fixed support is provided, and the staff itself has a metal stop secured to the back so that it will always have the same elevation when installed for use. [1]

TIDE STATION. (1) The geographic location at which tidal observations are made. (2) The equipment used to make tidal observations and its housing. Equipment and housing may include a shelter, a tide gage, a tide staff and tidal bench marks. According to the importance of the observations and the period over which they have been made continuously, a tide station is classified as a primary control, subordinate, secondary control, or tertiary tide station. At a primary-control tide station, observations have been made over at least 19 years; at a secondary-control tide station, observations have been made for more than 1 year but less than 19 years; and at a tertiary tide station, observations have been made for at least 30 days but for less than 1 year. A subordinate tide station is either (a) one at which a relatively short series of observations has been made and reduced by comparing them with records from a nearby tide station with a long series of observations, or it is (b) one listed in the National Ocean Service Tide Tables for which predictions are to be obtained by means of differences and ratios applied to the full predictions for a nearby tide station. [39]

TIDE TABLES. (1) Tables which give the predicted times and heights of high and low water for every day in the year for a number of reference stations, and tidal differences and ratios by which additional predictions can be obtained for subordinate stations. From these values it is possible to interpolate by a simple procedure the height of the tide at any hour of the day. See also Tidal Current Tables. (2) Tide tables; published annually by the National Ocean Service in four volumes. [1]

TIDEWATERS. Waters subject to the rise and fall of the tide. Sometimes used synonymously with tidelands, but would be better to limit tidewaters to areas always covered with water. The amount of tide is immaterial. See Tidelands. [3]

TIME SHARING. (1) (ISO) An operating technique of a computer system that provides for the interleaving in time of two or more processes in one processor. (2) Pertaining to the interleaved use of time on a computing system that enables two or more users to execute computer programs concurrently. (3) (ISO) Deprecated term for conversational mode, time slicing. [20]

The use of a device for two or more purposes during the same overall time interval, accomplished by interspersing the computer component actions in time. [34]

TOE (ENGINEERING). Terminal edge or edges of a structure. [23]

TONGUE. A long, narrow strip of land, projecting into a body of water; a long, narrow body of water indenting the land or bounded by islands. [4]

TOPMARK. One or more relatively small objects of characteristic shape or color, or both, placed on top of a beacon or buoy to aid in its identification. The following characteristic shapes of topmarks are internationally recognized for the lateral system: cone, can, sphere, diamond, St. George's Cross, "T," and broom. A broom topmark has the appearance of a circular broomshead and has two forms: (1) broom, point upwards and (2) broom, point downwards. The following characteristic shapes of topmarks are internationally recognized for the cardinal system: two cones, point upwards; two cones, point downwards; two cones, point to point; two cones, base to base. Also called daymark, particularly in United States usage. [1]

TOPOGRAPHIC MAP. A map which presents the vertical position of features in measurable form as well as their horizontal positions. [1]

TOPOGRAPHIC SURVEY (NATIONAL OCEAN SERVICE). A record of a survey, of a given date, of the natural features and the culture of a portion of the land surface and their delineation by means of conventional symbols. As used in this publication, it is the original field survey sheet and is the authority for the high-water line and all information inshore of that line including geographic names of topographic features. See Photogrammetric Survey. [3]

TOPOGRAPHY. The configuration of the surface of the earth, including its relief, the position of its stream, roads, cities, etc. The earth's natural and physical features collectively. A single feature such as a mountain or valley is termed a topographic feature. Topography is subdivided into hypsography (the relief features), hydrography (the water and drainage features), culture (manmade features), and vegetation. (2) The science of delineation of natural and manmade features of a place or region especially in a way to show their positions and elevations. The term includes the scientific and technical fields of surveying, geodesy, geophysics, military geography, photogrammetry, cartography, graphic arts, and related activities to the extent that they are essential to the accomplishment of the military mapping, geodesy, and military geographic intelligence mission. (3) In oceanography, the term is applied to a surface such as the sea bottom or a surface of given characteristics within the water mass. [10]

TOWNSHIP. The unit of land into which the public lands of the United States of America were officially divided by surveys; normally it is a quadrangle approximately 6 miles on a side with boundaries conforming to meridians and parallels, and located with respect to the initial point of a principal meridian and baseline.

Townships are numbered consecutively north and south from a baseline; thus "township 14 north" indicates a township in the 14th tier north of a baseline. The word "range" is used together with the appropriate number and direction to indicate the coordinates of a particular township with respect to the initial point; thus "township 14 north, range 3 east" indicates the 3rd township east of the principal meridian in the 14th tier north of the baseline controlling the surveys in that area. The plural from, "townships" or "tps.", is used whenever more than one unit is to be indicated; thus, "townships 14 north, ranges 3, 4, and 5 east" and "townships 14 and 15 north, range 3 east." [39]

TP SHEET (MAP). The term "TP Sheet" refers to photogrammetric surveys planned and executed after 1968. Photogrammetric surveys of the "TP" series will be graphically depicted in the form of a shoreline map. Shoreline maps of the "TP" series will generally depict shoreline in planimetric detail. The discontinuance of the term "sheet" is encouraged. See shoreline map. In special survey projects, such as a shoreline/photobathymetry survey, the shoreline map may consist of the base map and one or more overlays. The overlays are considered part of the map and will be registered with the shoreline map. See Shoreline Maps. [32]

TRACE PROGRAM (ISO). A computer program that performs a check on another computer program by exhibiting the sequence in which the instructions are executed and usually the results of executing the instructions. [20]

TRACK. (1) The intended or desired horizontal direction of travel with respect to the earth. The track as expressed in degrees of the compass may be different from the course due to such factors as making allowance for current or sea or steering to resume the track. (2) The path of intended travel with respect to the earth as drawn on the chart. Also called intended track, track-line. (3) The actual path of a vessel over the ground, such as may be determined by tracking. [1]

TRACK LINE OF SOUNDING. A continuous record of soundings obtained by a ship on an extended voyage en route between its home port and the working ground. Also called cruise line of sounding. [17]

TRAFFIC LANE. An area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones, may constitute a boundary. [19]

TRAFFIC SEPARATION SCHEME. A scheme which separates traffic proceeding in opposite or nearly opposite directions by the use of a separation zone or line, traffic lanes or by other means. [19]

Shipping corridors marked by buoys which separate incoming from outgoing vessels. Improperly called sea lanes. [37]

TRAINING WALL. A training wall is a structure built alongside a channel to direct the tidal stream or currents through the channel to promote a scouring action. Training walls are often submerged at high water. The recommended symbol, unless the scale is large enough to show the actual outline, is a very bold line, continuous where the wall always remains above water, dashed were it may be submerged. If submerged, or partly submerged, any associated lettering should be sloping. [16]

TRANSACTION FILE (ISO). A file containing relatively transient data, that, for a given application, is processed together with the appropriate master file. Synonymous with detail file. [20]

Transactions accumulated as a batch ready for processing against the master file. [34]

TRANSCRIBE (ISO). To transmit data from one data medium to another, converting them as necessary for acceptance by the receiving medium. [20]

TRANSFORM (ISO). To change the form of data according to specified rules, without significantly changing the meaning of the data. [20]

To change the structure or composition of information without altering its meaning or value; to normalize, edit, or substitute. [34]

TRANSIT. A surveying instrument composed of a horizontal circle graduated in circular measure and an alidade with a telescope which can be reversed in its supports without being lifted therefrom. Also, the act of making such reversal. A theodolite having a telescope that can be transited in its supports is a transit, and is sometimes termed a transit theodolite. All modern theodolites are transits. [17]

TRANSPARENCY. A photographic image intended to be viewed by transmitted light: for example, a slide. [28]

TRANSVERSE MERCATOR PROJECTION. A conformal map projection in which the normal Mercator projection is rotated (transversed) 90° in azimuth, the central meridian corresponding to the line which represents the equator on the normal Mercator. The characteristics as to scale are identical to those of the normal Mercator, except that the scale is dependent on distances east or west of the meridian instead of north or south of the equator. The projection is used as the base for the state coordinate systems for states whose greatest extent is in a north-south direction. See State Coordinate Systems; Mercator Projection. [3]

TRAVERSE. A route and a sequence of points on it at which observations are made; or the route, the points, and the observations at those points; or the process by which the route and sequence are established. In particular, a survey traverse. Unless specifically stated otherwise, a traverse is horizontal i.e., a procedure for determining only the horizontal coordinates of the points in the traverse. [39]

TRAVERSE, FIRST ORDER. A survey traverse which by itself forms a closed traverse, or which extends between adjusted locations of first-order control, and the points of which are first-order control. The standards for first-order control are given in Federal Geodetic Control Committee (1984). The standards and criteria supersede those recommended earlier by the U.S. Bureau of the Budget in 1958. This earlier category for first-order traverse was roughly equivalent to the second-order class II category of 1974 and to the "first-order traverse" category of the 1925 classification. Before 1925, the 1925 first-order category was known as "precise traverse." [39]

TRAVERSE, FOURTH-ORDER. A survey traverse establishing control less accurate than that of third-order traverse. In fourth-order traverse, angles are observed with a transit or sextant, or are determined graphically, and distances are measured with tape, stadia, or wheel. [39]

TRAVERSE, SECOND-ORDER. A survey traverse which by itself forms a closed traverse or extends between control points of the same or higher category, and which consists of second-order control. The U.S. Federal Board of Surveys and Maps established the second-order traverse category in may 1925. Because the bases for classification were different from those used for the 1974 classification, the second-order traverse category of 1925 cannot be equated to one of the categories of the 1974 scheme of classification. It probably fits somewhere between third-order class I and second-order class II of the 1974 scheme. [39]

TRAVERSE, SURVEY. A route and a sequence of points between which distances and directions have been obtained by or from field measurements and have been used in determining locations of the points. It is usually referred to simply as a traverse, when no confusion is likely. A survey traverse may determine the relative locations of the points which it connects in sequence. If the locations are determined with the use of coordinates of control stations on an adopted datum, the locations may be referred to that datum. Survey traverses are classified and identified in a variety of ways such as: according to methods used, e.g., an astronomical traverse; quality of results, e.g., a first-order traverse; purpose served, e.g., a geographical-exploration traverse; or according to form, e.g., a closed traverse. [39]

TRAVERSE, THIRD-ORDER. A survey traverse which by itself forms a closed loop or which extends between control points of the same or higher category, and which consists of control of third-order or higher category. The earlier, "third-order traverse" category of the U.S. Federal Board of Surveys and Maps recommended in May 1925 was roughly equivalent to the same category in the 1974 classification. However, the base for classification in the two schemes are so different that exact equivalence cannot be determined. [39]

TRENCH. A long, narrow, characteristically very deep and asymmetrical depression of the sea floor, with relatively steep sides. See also Trough. [1]

TRIANGULATION. (1) A method of surveying in which the points whose locations are to be determined, together with a suitable number (at least two) of points of known location, are connected in such a way as to form the vertices of a network of triangles. The angles in the network are measured and the lengths of the sides are either measured or calculated from known points and lengths. Sides with measured lengths are called base lines. Classically, only a very few, short base lines are in the network; these are connected to the sides of triangles of normal size by a sequence of triangles of increasing size. Triangulation permits selection of sites for stations and base lines that are favorable both from topographic and geometric considerations. Triangulation is well adapted to the use of precise instruments and methods in all its operations, and can yield results of great accuracy and precision. It is generally used where the region to be surveyed is large. The term triangulation may be considered as including not only the actual operations of observing angles and measuring base lines, and the reduction of the data, but also the reconnaissance and any astronomic observations that precede those operations. (2) The survey network resulting from triangulation in sense (1) above. [39]

TRIANGULATION, CLASSIFICATION OF. The category of a triangulation project or network is the same as the category of the control established by that project or contained in that network. In the schemes of classification used by the U.S. Government, the practice has been

to name categories in order of increasing size of relative error involved. Before 1921, the categories were primary, secondary, and tertiary triangulation. From 1921 to 1924, they were precise, primary, secondary, and tertiary triangulation. From 1925 to 1957 they were first-order, second-order, third-order, and forth-order triangulation. In 1957, they were changed to first-order, second-order, third-order triangulation, and each of these categories was subdivided into classes: first-order triangulation was classified as special, class I, and class II; second-order triangulation was classified as class I and class II. In 1974, a different subdivision was adopted. First-order triangulation is not subdivided into classes, while second-order and third-order triangulation each contain two classes - class I and class II. [39]

TRIANGULATION, SATELLITE. Any method of determining the coordinates of points on the Earth by measuring directions from these points to one or more artificial satellites. One method has been to photograph the satellite against a stellar background, so the stars can be used to obtain directions. Although it is theoretically possible to do without stars by measuring the vertical and horizontal angles to the satellite from each point, the directions thus determined are less accurate than those determined using stars. Usually, the term is assumed to imply that observations are made simultaneously, or nearly so, from two or more points on the ground. [39]

TRIG LIST. A list published by certain Army units which includes essential information of accurately located survey points. [13]

TRILATERATION. A method of surveying wherein the lengths of the triangle sides are measured, usually by electronic methods, and the angles are computed from the measured lengths. See also Triangulation. [10]

TRIM MARKS. Lines placed on original copy to serve as guides in cutting or trimming the printed sheets to their prescribed size. [10]

TROUGH. (1) A long depression of the sea floor, characteristically flat bottomed and steep sided, and normally shallower than a trench. (2) The lowest part of a wave, between two crests if called wave trough. [1]

TRUE NORTH. The direction from an observer's position to the geographical North Pole. The north direction of any geographic meridian. (The term was originally applied to astronomic north to distinguish it from magnetic north.) [10]

TRUE TO SCALE. A condition where map measurements are in exact agreement with the stated map scale. Since all map projections involve some scale change, the scale is not true at all places on a map. [10]

T-SHEET (MAP). The term "T Sheet" refers to the planetable and photogrammetric surveys conducted by the Coast Survey, Coast and Geodetic Survey, ESSA, and the National Ocean Survey (NOS) during the period of 1834 to 1980. These surveys were recorded graphically in the form of a map, which is generally referred to as a shoreline map. Shoreline maps of the "T" series depict shoreline data, planimetric detail possibly topographic detail dependant upon the project instructions. The preferred term is "shoreline map" and the discontinuance of the term "Sheet" is encouraged. [32]

TSUNAMI, TUNAMI. A long-period sea wave, potentially catastrophic, produced by a submarine earthquake or volcanic eruption. It may travel unnoticed across the ocean for thousands of

miles from its point of origin. It builds up to great heights over shoal water. Also called seismic sea wave, tidal wave. [1]

TULE. Reed. Bulrush. A place where reeds grow. Corruption of Spanish "Tulares." [41]

TUNDRA. One of the level or undulating treeless plains characteristic of arctic regions, having a black muck soil with a permanently frozen subsoil. [4]

TURNAROUND TIME (ISO). The elapsed time between submission of a job and the return of the complete output. [20]

(1) The particular amount of time that is required for a computation task to get from the programmer to the computer, onto the machine for a test or production run, and back to the programmer in the form of the desired results. (2) The elapsed time between submission of a job to a computing center and the return of results. (3) In communications, the actual time required to reverse the direction of transmission from sender to receiver or vice versa when using a two-way alternate circuit. [34]

TURNING BASIN. A water area used for turning vessels. [1]

TWO-WAY ROUTE. A route within defined limits inside which two-way traffic is established, aimed at providing safe passage of ships through waters where navigation is difficult or dangerous. [19]

TWO POINT FEATURE. A cartographic feature that can be positioned with one set of coordinates describing its location and a second set of coordinates defining its orientation. A special kind of point feature. [22]

TYPE. In printing (typography) a metal block having a raised letter or figure which, when inked, is used to make an impression on paper or other material. Type can also be in the form of negative or positive stripping film. [17]

TYPE FACE. A type of print, such as Roman, Egyptian, Caslon, etc. [17]

TYPE FONT. A printing type face of a given style and size; e.g., 10-point Univers bold. [22]

TYPE OF TIDE. A classification based on characteristic forms of a tide curve. Qualitatively, when the two high waters and two low waters of each tidal day are approximately equal in height, the tide is said to be semidiurnal; when there is a relatively large diurnal inequality in the high or low waters or both, it is said to be mixed; and when there is only one high water and one low water in each tidal day, it is said to be diurnal. [7]

TYPESETTING. The preparation of lettering (a) by the manual assembly of type; (b) by the use of a composing machine; or (c) by filmsetting. [21]

U

UNDER CONSTRUCTION. The term used to indicate that the feature on the map is not completed but that construction has started. It must not be confused with "proposed" which means that the feature has been planned but construction has not been started. [35]

UNIFORM STATE WATERWAY MARKING SYSTEM. A system developed jointly by the U.S. Coast Guard and state boating administrators to assist the small craft operator in those state waters marked by participating states. It consists of two categories of aids to navigation. One is a system of aids to navigation, generally compatible with the Federal lateral system of buoyage, to supplement the federal system in state waters. The other is a system of regulatory markers to warn the small craft operator of dangers or to provide general information and directions. [1]

UNITED NATIONS EDUCATIONAL, SCIENTIFIC, AND CULTURAL ORGANIZATION: UNESCO. Organized in 1945 to promote collaboration among nations in education, science, and culture, UNESCO is the parent agency for the Intergovernmental Oceanographic Commission (IOC), which promotes cooperation in the marine sciences. Within UNESCO headquarters is a Division of Marine Sciences (formerly the Office of Oceanography). Before the establishment of IOC, UNESCO sponsored the International Advisory Committee on Marine Sciences (IACOMS), created in 1955 to consider the U.N. role in marine sciences. IACOMS, comprising nine persons appointed as representatives of the different areas of the world, was severely handicapped: it had no charter or authority and was limited in funds. It did, however, focus attention on marine sciences and was instrumental in recommending the establishment of IOC. UNESCO, as well as IOC, lends financial support to such organizations as SCOR, which in turn offer scientific advice on specific research aspects of UNESCO's and IOC's programs. They also provide financial support to other international organizations by helping pay travel expenses of scientists from developing countries who attend symposia and conferences. [38]

UNITED STATES ARMY CORPS OF ENGINEERS: USACE. The Commanding General, United States Army Corps of Engineers (CGUSACE) serves as the Army's Real Property Manager, performing the full cycle of real property activities (requirements, programing, acquisition, operation, maintenance and disposal); manages and executes engineering, construction, and real estate programs for the Army and the United States Air Force; and performs research and development in support of these programs. CGUSACE manages and executes Civil Works Programs. These programs include research and development, planning, design, construction, operation and maintenance, and real estate activities related to rivers, harbors and waterways; administration of laws for protection and preservation of navigable waters and related resources such as wetlands. CGUSACE assists in recovery from natural disasters. [2]

UNITED STATES COAST GUARD. The Coast Guard, established by the act of January 28, 1915 (14 U.S.C. 1), became a component of the Department of Transportation on April 1, 1967, pursuant to the Department of Transportation Act of October 15, 1966 (80 Stat. 931). The Coast Guard is a branch of the Armed Forces of the United States at all times and is a service within the Department of Transportation except when operating as part of the Navy in time of war or when the President directs. The predecessor of the Coast Guard, "The Revenue Marine," was established in 1790 as a Federal maritime law enforcement agency. Many

other major responsibilities have since been added.

Functions and Activities:

Search and Rescue. The Coast Guard maintains a system of rescue vessels, aircraft, and communications facilities to carry out its function of saving life and property in and over the high seas and the navigable waters of the United States. This function includes flood relief and removing hazards to navigation.

Maritime Law Enforcement. The Coast Guard is the primary maritime law enforcement agency for the United States. It enforces or assists in the enforcement of applicable Federal laws and treaties and other international agreements to which the United States is party, on and under the high seas and waters subject to the jurisdiction of the United States, and may conduct investigations into suspected violations of such laws and international agreements. The Coast Guard works with other Federal agencies in the enforcement of such laws as they pertain to the protection of living and nonliving resources and in the suppression of smuggling and illicit drug trafficking. [27]

UNITED STATES COAST PILOT. One of a series of nine sailing directions published by the National Ocean Service, that cover a wide variety of information important to navigators of U.S. coastal and intracoastal waters, and waters of the Great Lakes. Most of this information cannot be shown graphically on the standard nautical charts and is not readily available elsewhere. This information includes navigation regulations, outstanding landmarks, channel and anchorage peculiarities, dangers, weather, ice, freshets, pilots, and port facilities. Sailing directions for foreign waters are published by the Defense Mapping Agency Hydrographic/Topographic Center. Usually shortened to Coast Pilot. Each Coast Pilot is corrected through the dates of Notices to Mariners shown on the title page and should not be used without reference to the Notices to Mariners issued subsequent to those dates. [1]

UNITED STATED GEOLOGICAL SURVEY. The geological Survey was established by the act of March 3, 1879 (20 Stat. 394; 43 U.S.C. 31), which provided for "the classification of the public lands and the examination of the geological structure, mineral resources, and products of the national domain." The act of September 5, 1962, (76 Stat. 427; 43 U.S.C. 31(b)), expanded this authorization to include such examinations outside the national domain. Topographic mapping and chemical and physical research were recognized as an essential part of the investigations studies authorized by the act of March 3, 1879, and specific provision was made for them by Congress in the act of October 2, 1888, (25 Stat. 505, 526). Provision was made in 1894 for gaging the streams and determining the water supply of the United States (28 Stat.398). Authorizations for publication, sale, and distribution of material prepared by the Geological Survey were contained in several statutes (43 U.S.C. 41-45; 44 U.S.C. 260-262). The broad objectives of the Geological Survey are to perform surveys, investigations, and research covering topography, geology, and the mineral and water resources of the United States; classify land as to mineral character and water and power resources; enforce departmental regulations applicable to oil, gas, and other mining leases, permits, licenses, development contracts, and gas storage contracts; and publish and disseminate data relative to the forgoing activities. [27]

UNITED STATES-JAPAN COOPERATIVE PROGRAM IN NATURAL RESOURCES: UJNR. Established in 1964 by bilateral agreement between Japan and the United States, UJNR promotes coordination of efforts between the two nations and encourages the exchange of scientists, data, and information. Activities of the overall program include the

United States-Japan Science Program (UJSP), which includes basic and academic ocean research. UJSP receives guidance from the Marine Resources and Engineering Coordinating Committee (MRECC) of UJNR. UJNR establishes many panels that change as needed to work in specific areas. As of 1977 panels actively involved in marine science affairs were the Sea Bottom Surveys Panel, the Panel on Marine Observations and Forecasting, the Panel on Marine Electronics and Communications, the Panel on Diving Technology, the Panel on Marine Mining, the Panel on Marine Geology, and the Panel on Marine Facilities. [38]

UNITED STATES LAKE SURVEY: USLS. On March 3, 1841, Congress appropriated $15,000 for a "hydrographical survey of the northern and northwestern lakes," the region known today as the Great Lakes. The organization established to carry out this task, "The U.S. Lake Survey," was placed under the direction of the Army Topographical Engineers. In 1863 this organization was merged with the Corps of Engineers, and the Lake Survey remained under the direction of the Corps until 1970. The first three charts were published in 1852; one covered all of Lake Erie and the other two showed positions of the western end of the lake. The Great Lakes Pilot was first published as the Bulletin in 1889. On October 3, 1970, the U.S. Lake Survey was transferred from the Corps of Engineers to the Department of Commerce and merged with the Coast and Geodetic Survey to form the National Ocean Survey. Charting operations remained in Detroit under the name Lake Survey Center until July 1974. All operations were completely closed down on June 30, 1976. Responsibility for maintaining and issuing the suite of 145 charts was transferred to the National Ocean Service headquarters in Rockville, Maryland, and field operations were transferred to the Atlantic Marine Center, in Norfolk, Virginia. [29]

UNITED STATES NATIONAL MAP ACCURACY STANDARDS. (1) Horizontal accuracy: for maps at publication scales larger than 1:20,000, 90 percent of all well-defined features, with the exception of those unavoidably displaced by exaggerated symbolization, will be located within 1/30 inch (0.85 mm) of their geographic positions as referred to the map projection; for maps at publication scales of 1:20,000 or smaller, 1/50 inch (0.50 mm). (2) Vertical accuracy: 90 percent of all contours will be accurate within one-half of the basic contour interval. Discrepancies in the accuracy of contours and elevations beyond this tolerance may be decreased by assuming a horizontal displacement within 1/50 inch (0.50 mm). Also called map accuracy standards. [1]

UNIT, TAPE. A device consisting of a tape transport, controls, a set of reels and a length of tape which is capable of recording and reading information on and from the tape, at the request of the computer under the influence of a program. [24]

UNIVERSAL TIME (UT). Same as Greenwich Mean Time (GMT). [7]

UNIVERSAL TRANSVERSE MERCATOR GRID. A military grid system based on the transverse Mercator map projection, applied to maps of the earth's surface extending to 84°N and 80°S. [1]

UNSURVEYED AREA. Areas on a map or chart where both relief and planimetric data are unavailable. These areas are usually labelled "unsurveyed." Or an area on a map or chart which shows little or no charted data because accurate information is limited or not available. [13]

UPDATE. (1) To put into a master file changes required by current information or transactions. (2) To modify an instruction so that the address numbers it contains are increased by a stated amount each time the instruction is performed. [24]

UPLAND. A highland; ground elevated above the lowlands along a river or between hills. [4]

UPPER LIMIT OF NAVIGABILITY. The character of a river will, at some point along its length, change from navigable to non-navigable. Very often that point will be at a major fall or rapids, or other place where there is a marked decrease in the navigable capacity of the river. The upper limit will therefore often be the same point traditionally recognized as the head of navigation, but may, under some of the tests described above, be at some point yet farther upstream. [2]

UPWELLING. An upward flow of subsurface water due to such cases as divergences, offshore winds, and wind drift transports away from shore. [7]

URBAN AREA. An area predominantly occupied by man-made structures used for residential, commercial, and industrial purposes; the Bureau of Census defines communities over 2,500 and urbanized areas as urban areas. [23]

UTILITY PROGRAM. (ISO) A computer program in general support of the processes of a computer, e.g., a diagnostic program, a trace program, a sort program. Synonymous with service program. [20]

A standard routine used to assist in the operation of the computer, e.g., a conversion routine, a sorting routine, a printout routine, or a tracing routine. [34]

U.S. CONTROL SURVEY NETS. The two control survey nets being extended over the United States by the National Geodetic Survey for the control of nautical charts and topographic maps, and comprising: (1) The horizontal-control survey net consisting of arcs of first-order and second-order triangulation and lines of first-order and second-order traverse, a few of which have been executed by the United States Geological Survey, the Corps of Engineers, and other organizations. The data derived in this survey are being coordinated and correlated on the North American datum of 1927. The National Geodetic Survey is currently recomputing the horizontal control network to the North American datum of 1983. (2) The vertical-control survey net consisting of lines of first-order and second-order spirit leveling which determine the elevations of thousands of bench marks above a common datum, mean sea level. This net includes lines of levels run by the United States Geological Survey, the Corps of Engineers, and other organizations. [10]

U.S. SURVEY FOOT. The foot used by the National Ocean Service in which 1 inch is equal to 2.540005 centimeters. The foot equal to 0.3048 meter, exactly, adopted by Australia, Canada, New Zealand, South Africa, the United Kingdom, and the United States in 1959 was not adopted by the National Ocean Service because of the extensive revisions which would be necessary to their charts and measurement records. [1]

V

VACUUM FRAME. A glass-fronted frame used for printing-down photographic or photomechanical images in which close contact between the original and the sensitized document is maintained by means of pressure under a vacuum. [21]

VALLEY. On the sea floor, a relatively shallow, wide depression, the bottom of which usually has a continuous gradient. This term is generally not used for features that have canyon-like characteristics for a significant portion of their extent. [1]

VARIATION. (1) The angle between the magnetic and geographic meridians at any place, expressed in degrees and minutes east or west to indicate the direction of magnetic north from true north. The angle between magnetic and grid meridians is called grid magnetic angle, grid variation, or grivation. Called magnetic variation when a distinction is needed to prevent possible ambiguity. Also called magnetic declination. (2) Change or difference from a given value. [1]

VARIATION (OF COMPASS). Difference between true north as determined by the earth's axis of rotation and magnetic north as determined by the earth's magnetism. Variation is designated as east or positive when the magnetic needle is deflected to the east of true north, and as west or negative, when the deflection is to the west of true north. Also called magnetic declination. [7]

VEGETATION. The general term for all vegetable life shown on maps such as forests, trees, hedges, brush, grass, etc. [35]

VERIFIER (ISO). A device that checks the correctness of transcribed data, usually by comparing with a second transcription of the same data or by comparing a retranscription with the original data. [20]

VERIFIER'S REPORT. The Verifier's report is the renamed, but approximately equivalent, successor to the "Review Report." See Review Report; Evaluation Report. On the transfer of the formal hydrographic survey review function to the Marine Centers in October 1975, it was considered appropriate to revise the title of the report although the format and content remained essentially unaltered. Effective October 1, 1982, the title of this report was again revised to "Evaluation Report." The "Review Report," "Verifier's Report" and "Evaluation Report" are essentially equivalent documents; i.e., they serve the same purpose. [40]

VERTICAL CONTROL. The measurements taken by surveying methods for the determination of elevation only with respect to an imaginary level surface, usually mean sea level. [10]

VERTICAL CONTROL DATUM. Any level surface (as, for example, mean sea level) taken as a surface of reference from which to reckon elevations. Also called vertical datum; vertical geodetic datum. [10]

VERTICAL DATUM. A reference point or plane to which elevations of the land or depths of the sea are tied. See Tidal Datum. [3]

VERTICAL LIFE BRIDGE. A bridge with a movable span between two lift towers such that the entire span can be raised uniformly in the vertical direction.

VESSEL. "Vessel" includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on the waters of the United States. [2]

VESSEL TRAFFIC SERVICE AREA. A vessel traffic service area (VTS area) prescribe rules for vessel operation in order to prevent collisions and groundings and to protect the navigable waters of the VTS area from environment harm from collisions and groundings. [29]

VIADUCT. A structure consisting of a series of arches or towers supporting a roadway, waterway, etc., across a depression, etc. See also Causeway. [1]

VISIBILITY. That property of the atmosphere which determines the ability of an observer to see and identify prominent objects by day, or lights or lighted objects by night. A measure of this property is expressed in units of distance. This term should not be confused with visual range. See also Meteorological Visibility. [1]

VISUAL RANGE (OF A LIGHT). The predicted range at which a light can be observed. The predicted range may be either the luminous range or the geographic range. Therefore, in predicting the range at which a light can be seen, one first determines the geographic range to compare this range with the luminous range, if known. If the geographic range is less than the luminous range, the geographic range must be taken as the limiting range. If the luminous range is less than the geographic range, the luminous range must be taken as the limiting range. The luminous range is the maximum distance at which a light can be seen under existing visibility conditions. This luminous range takes no account of the elevation of the light, the observer's height of eye, the curvature of the earth, or interference from background lighting. The luminous range is determined from the known nominal luminous range, called the nominal range, and the existing visibility conditions, using the Luminous Range Diagram. The nominal range is the maximum distance at which a light can be seen in clear weather as defined by the International Visibility Code (meteorological visibility of 10 nautical miles). The geographic range is the maximum distance at which the curvature of the earth and terrestrial refraction permit a light to be seen from a particular height of eye without regard to the luminous intensity of the light. (The geographic range sometimes printed on charts or tabulated in light lists is the maximum distance at which the curvature of the earth and refraction permit a light to be seen from a height of eye of 15 feet above the water when the elevation of the light is taken above the height datum of the largest scale chart of the locality.) [1]

VOLATILE STORAGE (ISO). A storage device whose contents are lost when power is removed. [20]

A storage device in which stored data are lost when the applied power is removed, e.g., an acoustic delay line. [34]

VOLCANO. An opening in the earth from which hot gases, smoke, and molten material issue, or a hill or mountain composed of volcanic material. A volcano is characteristically conical in shape with a crater in the top. [1]

W

WARP. To move, as a vessel, from one place to another by means of lines fastened to an object, such as a buoy, wharf, etc., secured to the ground. [1]

WARPING BUOY. A buoy so located that lines to it can be used for the movement of ships. [1]

WASH. The dry channel of an intermittent stream. [1]

WASHOUT. The washout process (deep-etch procedure) is used to produce new nautical chart scribing negatives, and to replace old negatives that are considered no longer serviceable. The yellow scribeable mylar used for this process is pre-punched for subsequent registration and cleaned. It is then sensitized in a whirler, dried, and exposed in a vacuum frame in emulsion-to-emulsion contact to a chart plate positive. The exposed scribe sheet is washed with a deep etch developer removing the still soft areas (usually linework) that were shielded from exposure and hardening by the imagery of the positive, producing a new negative which is used for scribing and applying revising work required for the new printing. [29]

WATCHING PROPERLY. An aid on its assigned position exhibiting the advertised characteristics in all respects. [37]

WATERFRONT. Land at the end of a stream, harbor, etc. The part of a city or town on such land; wharf or dock area. [17]

WATERFRONT FACILITY. "Waterfront facility" means all piers, wharves, docks, and similar structures to which a vessel may be secured; areas of land, water, or land and water under and in immediate proximity to them; buildings on such structures or contiguous to them and equipment and materials on such structures or in such buildings. This term does not include facilities directly operated by the Department of Defense. [2]

WATERLINE. The line marking the junction of water and land. See also High Water Line; Low Water Line; Shoreline. [1]

The following water lines are those normally compiled on shoreline maps:

Area	Water Line
Tidal coastal waters	Mean high water line
Confined coastal waters	Mean water level line
Tidal rivers	Mean high water line
Great Lakes and connecting waterways	Water line at the time of photography
Other natural lakes	Water line at the time of photography
Reservoirs	Specified level above the Natural Geodetic Vertical Datum

[31]

WATERSHED. The area drained by a stream. [4]

WATERWAY. A water area providing a means of transportation from one place to another, principally a water area providing a regular route for water traffic, such as a bay, channel, passage, or the regularly traveled parts of the open sea. The terms waterway, fairway, and thoroughfare have nearly the same meanings. Waterway refers particularly to the navigable part of the water area. Fairway refers to the main traveled part of a waterway. A thoroughfare is a public waterway. See Canal. [1]

WAY POINT. A mark or place at which a vessel is required to report to establish its position. (Also known as Reporting Point or Calling-in-Point.) [19]

WEIR. A sort of fence set in a stream or along a shore line to catch fish. It differs from a pound because it is mainly constructed of brush hedging or narrow boards with or without nettings. The terms weir and pound are, to a great extent, used interchangeably in the United States. Also called brush weir, fish weir.

Fish weirs are fixed solid structures made of stones or stakes and wattlings, or a combination of both. The simplest form is a Y with the end toward high-water mark and the apex toward low water. In the apex there is very often a special cage or trap for the concentration or retention of the catch. Coastal weirs are generally built where there is a large expanse of ground left uncovered at low water. Weirs are usually kept in position all year round. [36]

A dam erected across a river to raise the level of the water. The word is now restricted to smaller works, the larger are called dams. [17]

A device in a dam consisting of a spillway in which a barrier (of beams, etc.) can be placed to raise the level of the water behind the dam. [35]

WEIR JETTY. An updrift jetty with a low section or weir over which littoral drift moves into a predredged deposition basin which is dredged periodically. [14]

WELLHEAD. A submarine structure projecting some distance above the seabed and capping a temporarily abandoned or suspended oil or gas well. See also Submerged Production Well. [1]

WESTERN RIVERS. The term "western rivers" as used in the regulations in this subchapter shall include only the Red River of the North, the Mississippi River and its tributaries above the Huey P. Long Bridge, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway. [2]

WET DOCK. See Non-Tidal Basin. [1]

WETLANDS. The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. [2]

WHARF. A structure of open rather than solid construction along a shore or a bank which provides berthing for ships and which generally provides cargo-handling facilities. A similar facility

of solid construction is called quay. See also Pier, definition 1; Dock; Landing; Mole. [1]

WINTER MARKER. A lighted or unlighted buoy without sound signal, which is established as a replacement during the winter months when other aids are closed or withdrawn. [37]

WINTER LIGHT. A light which is maintained during those winter months when the regular light is extinguished. It is of lower candlepower than the regular light but usually of the same characteristic. [37]

WIRE DRAG. An apparatus for surveying rock areas where the normal sounding methods are insufficient to insure the discovery of all existing obstructions, pinnacles, rocks, etc., above a given depth or for determining the least depth of an area. It consists essentially of a buoyed wire towed at the desired depth by two launches. Often shortened to drag. See also Drag. [1]

WITHDRAWN. The discontinuing of a floating aid during severe ice conditions or for the winter season. [37]

WORD. (1) (ISO) A character string or a binary element string that it is convenient for some purpose to consider as an entity. (2) A character string or a bit string considered as an entity. [20]

(1) A set of characters that occupies one storage location and is treated by the computer circuits as a unit and transported as such. Ordinarily a word is treated by the control unit as an instruction, and by the arithmetic unit as a quantity. Word lengths are fixed or variable, depending on the particular computer. (2) A unit of data. A set of characters that may be of any length and occupies one storage location. A word is usually treated as a unit by a data processing machine. Quantities, dollar amounts and names are examples of words. (3) In telegraphy, (5) characters plus 1 space, or 6 keystrokes. [34]

WORLD GEODETIC SYSTEM 1972. A world geodetic system is comprised of a consistent set of parameters describing the size and shape of the earth, the positions of a network of points with respect to the center of mass of the earth, transformations from major geodetic datums, and the potential of the earth (usually in terms of harmonic coefficients). World Geodetic System 1972 (WGS 72) represents the Defense Mapping Agency's (DMA's) modeling of the earth from a geometric, geodetic, and gravitational standpoint using data available in 1972. This system uses a semi-major axis of 6,378,135 meters and flattening of 298.26. To ensure the commonality essential for Worldwide Tri-Service Operations, WGS 72 is the geocentric system officially authorized for Department of Defense (DOD) use. [11]

WORLD GEODETIC SYSTEM 1984. A World Geodetic System is comprised of a consistent set of parameters describing the size and shape of the earth, the positions of a network of points with respect to the center of mass of the earth, transformations from major geodetic datums, and the potential of the earth (usually in terms of harmonic coefficients). World Geodetic System 1984 (WGS 84) represents the Defense Mapping Agency's (DMA's) modeling of the earth from a geometric, geodetic, and gravitational standpoint using data, techniques, and technology available in 1984. The reference figure for the System is GRS80, with semi-major axis of 6,378,137 meters and flattening of 1/298.257. To ensure the commonality essential for Worldwide Tri-Service Operations, and to provide Department of Defense (DOD) navigation and weapon systems with improved data, WGS 84 is the planned replacement for WGS 72 as the geocentric system officially authorized for DOD use. [11]

WRECK. The ruined remains of a vessel which has been rendered useless, usually by violent action, as by the action of the sea and weather on a stranded or sunken vessel. In hydrography the term is limited to a wrecked vessel, either submerged or visible, which is attached to or foul of the bottom or cast up on the shore. [1]

WRECK BUOY. A buoy marking the position of a wreck. It is usually placed on the seaward or channel side of the wreck and as near to the wreck as conditions will permit. To avoid confusion in some situations, two buoys may be used to mark the wreck. The possibility of the wreck having shifted position due to sea action between the times the buoy was established and later checked or serviced should not be overlooked. [1]

WRECKS. Charted wrecks are of two kinds: stranded wreck, where any portion of the hull is above the chart datum; and sunken wreck, where the hull is below the chart datum or where the masts only are visible. [3]

WRITE (ISO). To make a permanent or transient recording of data in a storage device or on a data medium. [20]

To transfer information to an output medium; to copy, usually from internal storage to external storage; to record information in a register, location, or other storage device or medium. [34]

WRONG-READING. A descriptive term for an image which is a reversed or mirror image of the original. Other terms, such as reverse reading, etc., are sometimes used to identify image direction, but are not recommended because of possible confusion in film negative-positive relationship. [10]

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X

X-AXIS. A horizontal axis in a system of rectangular coordinates; that line on which distances to the right or left (east or west) of the reference line are marked, especially on a map, chart, or graph. [17]

The right hand axis of a cartesian coordinate system as normally used by display or plotting equipment. [22]

XEROGRAPHY. An electrostatic duplicating process in which photographic images are recorded on a charged surface, and then reproduced on paper. [30]

X/Y PLOTTER. A plotter using a cartesian coordinate system. Since practically all plotters do so, the prefix "x/y" is not very meaningful and usually left off. [22]

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Y

YARD. A fundamental unit of length in the English system of measurement. The metric equivalent prior to July 1, 1959, was 1 yard = 0.91440183 meter. On that date the value was changed to 1 yard = 0.9144 meter. This change will not apply to any data expressed in feet derived from and published as a result of geodetic surveys within the United States until such time as the basic geodetic survey networks are readjusted. See Nautical Mile. [3]

(1) A unit of length in the English system equal in the United States since 1866 to exactly 3600/3937 of a meter. Compare with Foot, survey. (2) A unit of length defined to be exactly 0.9144 meter. Also known as the international yard.

The yard has been the basic unit of length in the English system of measure since at least 1742, when a brass bar inscribed with a 3-foot scale was made by the Royal Society. A copy made in 1760 was adopted by act of Parliament, January 1, 1826, as embodying the legal definition of the yard. This copy, called the Imperial Standard Yard and stored in the Houses of Parliament, was destroyed by fire in 1834. The length of a new standard of bronze and gold, constructed by comparing existing copies, was, in 1855, designated legally to be the Imperial Standard Yard. This standard yard is the distance between marks on two golden plugs in the bronze bar (at a temperature of 62°F). As of 1951, this standard is kept at the Board of Trade in London The Weights and Measures Act of 1872 defines this standard as the British Imperial Yard. A comparison with the International Meter in 1894 gave 1 meter = (39.370113/ 36) yard. Later measurements in 1927 and 1934 gave 47 and 38, respectively, instead of 13, in the last two places of the numerator; however, the 1894 value remained the legal value until 1963. In 1959 the International yard (0.9144 m) was adopted in the British Commonwealth and the United States of America for scientific purposes. In 1963 the British yard was redefined officially as exactly 0.9144 meters. Until 1836 there was no standard unit of measure in the United States. In that year, an act of Congress established the yard as a standard, defining it as the distance between the 27th and 63rd inches of the Troughton bar, an 82-inch long, graduated, brass bar made by Troughton of England and brought to the United States of America by Hassler in 1813. This was supposed to be a copy of the British Imperial Yard (1760). It was replaced in 1856 by two copies of the 1855 British Imperial Yard. In July 28, 1866, Congress passed a law making use of the metric system legal in the United States of America and defining the yard as 3600/3937 of the meter. On April 5, 1893, the Secretary of the Treasury approved an order by the Office of Weights and Measures (the Mendenhall act) officially establishing the definition given in the act of July 28, 1866. This order applied specifically to weights and measures used officially by the U.S. Government and by the separate States. For base line measurements made by the U.S. Coast and Geodetic Survey, the meter had been in use since 1805, when Hassler brought to the United States a copy (in iron) of the French meter of 1799. Note the distinction (2 parts in 1 million) between the official value of 3600/3937 meter and the international yard of 0.9144 m. See Foot, Survey. [39]

Y-AXIS. A vertical axis in a system of rectangular coordinates; that line on which distances above or below (north or south of) a reference line are marked, especially on a map, chart, or graph. The line which is perpendicular to the X-axis and passes through the origin. [17]

The left hand axis of a cartesian coordinate system as normally used by display and plotting equipment. [22]

Z

ZERO. (1) (ISO) In data processing, the number that when added to or subtracted from any other number does not alter the value of that other number. Zero may have different representations in computers such as positively or negatively signed zero (which may result from subtracting a signed number from itself) and floating-point zero (in which the fixed point part is zero while the exponent in the floating-point representation may vary). [20]

(1) Nothing. (2) The combination of coded bits that the computer recognizes as zero. Positive-binary zero is usually indicated by the absence of digits or pulses in a word; negative-binary zero in a computer operating on ones complements is usually indicated by a pulse in every pulse position in a word; in a coded-decimal machine, decimal zero and binary zero may not have the same representation. In most computers, distinct and valid bit structures are used for positive and negative zero. [34]

ZULU TIME. See Greenwich Mean Time. [1]

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NAUTICAL CHART MANUAL - VOLUME 2
DEFINITIONS, ABBREVIATIONS, SYMBOLOGY & REFERENCES
Seventh (1992) Edition

APPENDIX II - LIST OF CHARTING ABBREVIATIONS

Click on desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

U.S. Department of Commerce
Office of Coast Survey

APPENDIX II

LIST OF CHARTING ABBREVIATIONS

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

A	Ampere
AAPA	American Association of Port Authorities
A&D	Area and Depth Sheet
aband	Abandoned
ABAND LT HO	Abandoned lighthouse
ABS	American Bureau of Shipping
abt	About
ACG	Automated Cartography Group
ACG	Automated Charting Group
ACIC	Aeronautical Chart and Information Center
ACPG	Automated Cartographic Production Group
ACSM	American Congress on Surveying and Mapping
ADF	Automatic Direction Finder
ADP	Automatic Data Processing
Ad Wk	Additional Work
AERO	Aeronautical
AERO R Bn	Aeronautical Radiobeacon
AERO R Rge	Aeronautical Radio Range
AGU	American Geophysical Union
AIMS	American Institute of Merchant Shipping
AIS	Automated Information System
Al, Alt	Alternating (light)
alt	Altitude
ALWP	Adopted Average Low Water Plane
Am	Amber
AM	Amplitude Modulation
AMC	Atlantic Marine Center
AMS	Army Map Service
anc	Ancient
Anch	Anchorage
Anch prohib	Anchorage prohibited
ANCS	Automated Nautical Charting System
ANMC	American National Metric Council
ANSI	American National Standards Institute
Ant	Antenna
AOML	Atlantic Oceanographic & Meteorological Laboratory
AP	Aid Proof
APC	Aircraft Position Chart
API	American Petroleum Institute
approx	Approximate

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Apprs	Approaches
Apt	Apartment
Arch	Archipelago
Art	Articulated light
ASF	Additional Secondary Phase Factor
ASO	American Society for Oceanography
ASP	American Society of Photogrammetry
Astro	Astronomical
AT	Administrative and Technical
AUTH	Authorized
Aux	Auxiliary (light)
Ave	Avenue
AWOIS	Automated Wreck and Obstruction Information System

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

B

B	Bay
B	Bayou
B	Beacon
B, b	Black (see also bk, bl)
B	Blue
B 1	Dark blue areas
B 2	Light blue areas
Bdy Mon	Boundary monument
BELL	Fog bell
bet	Between
BGN	Board of Geographic Names
B Hbr	Boat harbor
BHS	Basic Hydrographic Survey
Bk	Bank
bk	Black (see also B, bl)
bk	Broken (see also brk)
Bkhd	Bulkhead
Bkw	Breakwater
Bl	Black (see also b, bk)
Bl	Blast
Bl	Blue (see also Bu)
bl	Black
Bld, Blds	Boulder, Boulders
Bldg	Building
BLM	Bureau of Land Management
Blvd	Boulevard
BM	Bench Mark
Bn	Beacon (in general)
Bp	Blueprint
BR	Bridge
Br, br	Brown
brg	Bearing
brk	Broken (see also bk)
BSSS, BS^3	Bathymetric Swath Survey System
Bu, bu	Blue (see also Bl)
BWHB	Black and white horizontal bands
BWVS	Black and white vertical stripes

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

C

C	Can, Cylindrical (buoy)
C	Cape
C	Cove
c	Coarse (bottom characteristic)
CA	Congressional Affairs
C&GS	Charting and Geodetic Services
C&GS	Coast and Geodetic Survey
Cap	Capitol
Cas	Castle
Cath	Cathedral
Cb	Cobbles
CCG	Canadian Coast Guard
CCZ	Coast Confluence Zone
cd	Candela
Cem	Cemetery
CERC	Coastal Engineering Research Center
CES	Chart Evaluation Surveys
CFR	Code of Federal Regulations
CG	Coast Guard
Ch	Church
Chan	Channel
CHAPP	Chart History and Plotting Parameter
Chec	Checkered (buoy)
CHS	Canadian Hydrographic Service
CHY, chy	Chimney
CICSS	Committee on the International Chart, Small Scales
CIE	International Commission on Illumination
CIS	Chart Information Section
Cl	Clay (see also cy)
Cl	Clearance
cm	Centimeter
Co	Company
Co	Coral
COBOL	Common Business-oriented Language
COE, C of E	Corps of Engineers
Co Hd	Coral head
COLREGS	International Regulations for Preventing Collisions at Sea, 1972
concr	Concrete
conspic	Conspicuous
Conus	Continental United States
cor	Corner
corr	Correction
Cov	Covered

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Cov	Covers
cps	Cycles per second
CPU	Central Processing Unit
Cr	Creek
CRD	Columbia River Datum
crs	Coarse (see also c)
CRT	Cathode Ray Tube
CS	Corridor Survey
c/s	Cycles per second (see also cps)
CSC	Chart Specification Committee
CSC	Corrected Sounding Compilation
Cswy	Causeway
CT HO, Ct Ho	Courthouse
CUP, Cup	Cupola
CUS HO, Cus Ho	Customhouse
Cy	Clay (see also cl)

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

D

D	Doubtful
D	Destroyed (see also Destr)
dec	Decayed
deg	Degrees
Destr	Destroyed
dev	Deviation
DFS	Distance Finding Station
diag	Diagonal bands
DIA	Diaphone
DIPFILE	Discrete Independent Point File
Discol	Discolored
discontd	Discontinued
dist	Distant
dk	Dark
dm	Decimeter
DMA	Defense Mapping Agency
DMAAC	Defense Mapping Agency Aerospace Center
DMAHTC	Defense Mapping Agency Hydrographic/Topographic Center
DME	Distance measuring equipment
Dms	Meridional differences
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
Dol	Dolphin
DON	Department of the Navy
DOS	Department of State
DOT	Department of Transportation
Dps	Parallel differences
DR	Dead Reckoning
DR	Descriptive Report
DRDG RGE	Dredging range
DW	Deep water
DWMP	Double-weight matte paper
DWP	Deepwater port

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

E

E	East, Eastern
ED	Existence doubtful
Ed	Edition
EEZ	Exclusive Economic Zone
E Int	Isophase Light (equal interval)
elec	Electric
ELEV	Elevator
Elev, elev	Elevation, Elevated
E'ly	Easterly
Entr	Entrance
EOT	End-of-Tape marker
EPA	Environmental Protection Agency
EPI	Electronic Position Indicator
ERL	Environmental Research Laboratories
ESSA	Environmental Science Services Administration
Est	Estuary
estab	Established
Exper	Experimental
explos	Explosive
Explos Anch	Explosive anchorage (buoy)
Exting	Extinguished (light)
extr	Extreme

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

F

F	Fisheries
F	Fixed (light)
f	Fine (see also fne)
FAA	Federal Aviation Administration
Facty	Factory
FCC	Federal Communications Commission
FCZ	Fishery Conservation Zone
Fd	Fjord
FE	Field Examinations
F Fl	Fixed and flashing (light)
F Gp Fl	Fixed and group flashing (light)
Fl	Flash, flashing (light)
fl	Flood
FLP	Fineline paper
Flt	Float
FM	Frequency Modulation
fm	Fathom
FMC	Financial Management Center
fne	Fine (see also f)
Fog Det Lt	Fog detector light
Fog Sig	Fog signal station
FP	Flagpole
FR	Federal Register
FRP	Federal Radionavigation Plan
FS	Flagstaff
Fsh Stks	Fishing stakes
Ft	Fort
ft	Foot, Feet
F TR	Flag tower
FWD	Forward
FY	Fiscal Year
Fy	Ferry

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

G

G	Gulf
G	Gravel
G	Green (see also Gn, gn)
GAB	Gable
GC	General Counsel
GCLWD	Gulf Coast Low Water Datum
GEBCO	General Bathymetric Chart of the Ocean
glac	Glacial
GLERL	Great Lakes Environmental Research Laboratory
GMT	Greenwich Mean Time
Gn, gn	Green (see also G)
GONG	Fog gong
Govt Ho	Government house
Gp	Geographic Position
Gp	Group
Gp Fl	Group flashing
GPO	Government Printing Office
Gp Occ	Group occulting
GPS	Global Positioning System
Grd, grd	Ground
GRI	Group Repetition Interval
Grs	Grass
grt	Gross ton
GSA	General Services Administration
G SEC	Green sector
gt	Great
gty	Gritty
GUN	Explosive fog signal, fog gun
Gy, gy	Gray

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

H

h	Hard (see also hrd)
h	Hour (see also hr)
HB	Horizontal bands
Hbr	Harbor
Hbr Mr	Harbor master
Hd	Head, headland
HECP	Harbor entrance control post
HHW	Higher high water
Hk	Hulk
Hn	Haven
HO	House
Hor	Horizontal lights
HOR CL	Horizontal clearance
HORN	Fog trumpet, foghorn, reed horn, typhon
Hosp	Hospital
hr	Hour (see also h)
hrd	Hard (see also h)
HS	Half size
HS	High school
ht	Height
HW	High Water
HWL	High Water Line
Hy	Highway
Hz	Hertz

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

I

I	Island (see also Is)
IALA	International Association of Lighthouse Authorities
IAGS	Inter American Geodetic Survey
ICW	Intracoastal Waterway
IGLD (1955)	International Great Lakes Datum (1955)
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
IMCO	Intergovernmental Maritime Consultive Organization
IMO	International Maritime Organization
in, ins	Inch, Inches
In	Inlet
INMARISAT	International Maritime Satellite System
INMARSAT	International Maritime Satellite Organization
Inst	Institute
I Q, I Qk, Int Qk	Interrupted quick
Irreg	Irregular
Is	Islands (see also I)
ISLW	Indian Spring Low Water
ISO	International Order of Standardization
Iso	Isophase
It	Islet
IUQ	Interrupted ultra quick
IVQ	Interrupted very quick
IWW	Intracoastal Waterway

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

J

JCL	Job Control Language
JCP	Joint Committee on Printing
JCS	Joint Chiefs of Staff

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

K

K	Kelvin
K	Kelp
K	Thousand
kc	Kilocycle
kg	Kilogram
kHz	Kilohertz
km	Kilometer
kn	Knot

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

L

L	Lake
La	Lava
Lag	Lagoon
LANBY	Large Automated Navigation Buoy
lat	Latitude
LD	Least Depth
Ldg	Landing
Ldg Lt	Leading light
Le	Ledge
LF	Low frequency
LFl	Long flashing (light)
Lit	Little
LLW	Lower Low Water
LLWD	Lower Low Water Datum
LNB	Large Navigational Buoy
Lndg	Landing
LNG	Liquified natural gas
LNM	Local Notice to Mariners
long	Longitude
LOOK TR	Lookout station, watch tower
LOP	Line of position
LORAN	Long-Range Navigation
LPI	Lines per inch
lrg	Large
LS	Lake Survey
LS	Lightship
LSS	Lifesaving station
Lt	Light
lt	light (bottom characteristic)
Ltd	Limited
LT HO, Lt Ho	Lighthouse
LW	Low Water
LWD	Low Water Datum
LWL	Low Water Line

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

M

M	Nautical mile (see also M, NM)
M	Mud, Muddy
m	Medium
m	Meter
m	Minute (of time)
Ma	Marsh
mag	Magnetic
Magz	Magazine
Maintd	Maintained
MARAD	Maritime Administration
max	Maximum
Mc	Megacycle
MCB	Marine Chart Branch
MF	Medium frequency
Mg	Mangrove
MGRS	Military Grid Reference System
MHHW	Mean Higher High Water
MHW	Mean High Water
MHWL	Mean High Water Line
MHWN	Mean High-Water Neaps
MHWS	Mean High Water Springs
MHz	Megahertz
Mi	Nautical mile (see also M, NM)
MICRO TR	Microwave tower
mid	Middle
min	Minimum
min	minute (see also m, ')
Mkr	Marker
Ml	Marl
MLLW	Mean Lower Low Water
MLW	Mean Low Water
MLWL	Mean Low Water Line
MLWN	Mean Low Water Neaps
MLWS	Mean Low Water Springs
mm	Millimeter
MMS	Minerals Management Service
Mn	Manganese
Mo	Morse code light, fog signal

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

mod	Moderate
MODU	Mobile Offshore Drilling Unit
Mol	Mole
MON	Monument
MPR	Monthly Program Review
Ms	Mussels
MSC	Marine Weather Services Chart
MSL	Mean Sea Level
Mt	Mountain, Mount
Mth	Mouth
MTL	Mean Tide Level
MTS	Marine Technology Society
MWL	Mean Water Level

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

N

N	North, Northern
N	Nun, Conical (buoy)
N/A	Not Applicable
NACOA	National Advisory Committee on Oceans and Atmosphere
NAD 83	North American Datum of 1983
NAD 27	North American Datum of 1927
NANCI	New Aeronautical and Nautical Charting Investigations
NAS	National Academy of Science
NAS	Navigable Area Surveys
NASA	National Aeronautics and Space Administration
NAUTO	Nautophone
NAVD	North American Vertical Datum
NAVOCEANO	U.S. Naval Oceanographic Office
NAVSTAR	Navigation System Using Time and Ranging
NBS	National Bureau of Standards
NCD	Nautical Charting Division
NCIC	National Cartographic Information Center (DOI/GS)
NCS	Nautical Chart Section
NDB	Nondirectional Beacon
NDHF	New Data Holding File
NE	Northeast
NGS	National Geodetic Survey
NGVD	National Geodetic Vertical Datum
N'ly	Northerly
NM	Nautical Mile (see also M, Mi)
NM	Notice to Mariners
NMAS	National Map Accuracy Standards
NMFS	National Marine Fisheries Services
NNSS	Navy Navigational Satellite System
No	Number
NOAA	National Oceanic and Atmospheric Administration
NOO	Naval Oceanographic Office
NOS	National Ocean Service
Np	Neap Tide
NPGS	Naval Post Graduate School
NPI	Nonphotographic Image
NPN	National Plan for Navigation
NPS	National Park Service

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

NRC	National Research Council
NSF	National Science Foundation
NSICC	North Sea International Chart Commission
NTIC	National Technical Information Service (DOC)
NTSB	National Transportation Safety Board
NW	Northwest
NWS	National Weather Service

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

O

OBSC	Obscured (light)
Obs Spot	Observation spot
Obstn	Obstruction
Obstr	Obstruction
Obsy	Observatory
Oc, Occ	Intermittent, Occulting (light), Occultation
Occas	Occasional (light)
OCS	Outer Continental Shelf
OCSEAP	Outer Continental Shelf Environmental Assessment Program (OMS)
ODAS	Ocean Data Acquisition Systems
Off	Office
OMB	Office of Management and Budget
Or, or	Orange
OSO	Origin of Sounding Overlay
OSS	Ocean Survey Sheet
OVHD PWR CAB	Overhead Power Cable
Oys	Oysters, Oyster bed
Oz	Ooze

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

P

P	Pebbles
P	Pillar (buoy)
P	Pond
P	Port
P	Position (see also Pos)
P	Pump-out facilities (see also P F)
PA	Position Approximate
PAIGH	Pan American Institute of Geography and History
Pass	Passage
Pav	Pavilion
PBM	Permanent Bench Mark
PD	Position doubtful
PDP	Program Development Plan
Pen	Peninsula
PIL STA, Pil Sta	Pilot Station
Pk	Peak
PMC	Pacific Marine Center, Seattle, Washington
PMERL	Pacific Marine Environmental Research Laboratory
PO	Post Office
Pos	Position (see also P)
PP	Policy and Planning
P.P.	Prepunched
PPI	Plan Position Indicator
Priv	Privately maintained
priv	Private, Privately
Priv maintd	Privately maintained
Prohib	Prohibited
Prom	Promontory
prom	Prominent
Prov	Provisional (light)
Pt	Point
pt	Point (type size)
Pub	Publication
P F	Pump-out facilities (see also P)
PWI	Potable Water Intake

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Q

Q, Qk Fl	Quick Flashing (light)
Quar	Quarantine

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

R

R	Red
R	River
R	Rocks
Ra	Radar station
RACON	Radar Transponder Beacon
Ra (conspic)	Radar conspicuous object
RA DOME, Ra Dome	Radar dome
RAM	Reliability, Availability, and Maintainability
Ra Ref	Radar reflector
Ra Sur	Radio responder beacon
RBHB	Red and black horizontal bands
R Bn	Radiobeacon (see also Ro Bn)
RC	Circular radiobeacon
RD, Rd	Road, Roadstead
rd	Red (bottom characteristic)
RDF	Radio Direction Finder
RDF, Ro DF	Radio direction finding station (see also RG)
REF, Ref	Reflector
Rep, rep	Reported
Restr	Restricted
RF	Radio frequency
Rf	Reef
RG	Radio direction finding station (see also RDF, Ro DF)
RGE, Rge	Range (navigation aid)
Rge	Range (coast feature)
Rk	Rock (coast feature)
Rk, rky	Rock, Rocky (bottom characteristic)
Rky, rky	Rocky (coast feature)
R MAST	Radio mast
R Lt	Red light
Ro Bn	Radiobeacon (see also R Bn)
Rot	Rotating, revolving (light)
RR	Railroad
R RELAY MAST	Radio relay mast
R SEC	Red sector
R Sta	Radio telegraph station, QTG radio station
RT	Radio telephone station

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

R TR	Radio tower
Ru	Ruins
RW	Rotating loop radiobeacon
RW Bn	Red and white beacon
RWVS	Red and white vertical stripe
Ry	Railway

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

S

S	Sand
S	South, Southern
S	Spar (buoy)
s	Second (see also sec, ")
SAR	Search and Rescue
SBC	Stable-base clear
SBM	Stable-base matte
SC	small-craft
Sch	School
SD	Sounding Datum
SD	Sounding Doubtful
Sd	Sound
SDS III	Shipboard Data System (III)
SE	Southeast
SEC	Sector
sec	Second (see also s, ")
Sem	Semaphore
SF	Secondary Phase Factor
S Fl	Short flashing (light)
sft	Soft (see also so)
SG	Sea Grant
Sh	Shells
shf	Super high frequency
shl	Shoal
Si	Silt
Sig Sta	Signal station
SIREN	Fog siren
Sk	Stroke, strike
SL, Sl	Sea level
S-L Fl	Short-long flashing (light)
SLSDC	St. Lawrence Seaway Development Corporation
Slu	Slough
S'ly	Southerly
sml	Small
Sn	Shingle
so	Soft (see also sft)
SOLAS	Safety of Life at Sea

SP	Spherical (buoy)
Sp	Spring tide
SPCS	State Plane Coordinate System
Spg	Sponge
S'PIPE	Standpipe
spk	Speckled
SPM	Single Point Mooring
SPOR	Shoreline Plane of Reference
SS	Same-size
S Sig Sta	Storm signal station
St	Saint
St	Street
St	Stones
Sta	Station
STARS	Survey Tracking and Reporting System
std	Standard
stf	Stiff
stk	Sticky (see also sy)
St M, St Mi	Statute mile
Str	Strait
Str	Stream
str	Streaky
sub	Submarine
SUB-BELL	Submarine fog bell
Subm, subm	Submerged
Subm ruins	Submerged ruins
Subm W	Submerged Well
SUB-OSC	Submarine oscillator
Sub Vol	Submarine volcano
SURF	Survey Users Request File
SW	Southwest
sw	swamp
SWGP	Single-weight glossy paper
SWMP	Single-weight matte paper
sy	Sticky

Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

T

T	Land tint
T	Telephone
T	Ton
T	True
TACAN	Tactical Air Navigation
TAI	International Atomic Time
TB	Temporary buoy
TD	Time difference
Tel	Telegraph
Telem Ant	Telemetry antenna
Tel Off	Telegraph Office
Temp	Temporary (light)
ten	Tenacious
Thoro	Thoroughfare
Tk	Tank
TLS	Tag Line Surveys
TLS	Traffic Lane Separation
TM	Transverse Mercator (projection)
TOA	Time of arrival
TR	Training Chart
TR, Tr	Tower
Tri	Triangulation
TSS	Traffic Separation Scheme
TT	Treetop
TV TR	Television tower (mast)

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

U

uhf	Ultra high frequency
UJNR	United States-Japan Cooperative Program in Natural Resources
U.K.	United Kingdom
U.N.	United Nations
Uncov	Uncovers, dries
Unesco	United Nations Educational, Scientific, and Cultural Organization
unev	Uneven
Unexam	Unexamined
UPS	Universal Polar Stereographic
µs, µsec	Microsecond
UQ	Continuous Ultra Quick
USC	Uncorrected Sounding Overlay
U.S.C.	United States Code
USCG	U.S. Coast Guard
USCGAUX	U.S. Coast Guard Auxiliary
USGS	U.S. Geological Survey
USN	United States Navy
USNC/CIE	U.S. National Committee/International Commission on Illumination
USO	Uncorrected Sounding Overlay
USPS	U.S. Power Squadron
UST	United States Treaties
UT	Universal Time
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

V

v	Volt, volts
var	Variation
vard	Varied
VB	Vertical beam
vel	Velocity
Vert	Vertical (lights)
VERT CL	Vertical clearance
VHF, vhf	Very high frequency
Vi, vi	Violet
View X	View point
Vil	Village
VLF	Very low frequency
Vol	Volcanic
Vol Ash	Volcanic ash
VOR	Very high frequency omnidirectional range
VORTAC	Collocated VOR and TACAN
VQ, V Qk Fl	Very quick flashing (light)
VS	Vertical stripes
VTS	Vessel Traffic Service

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Click on Desired Section: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

W

W	West, Western
W, w	White (see also wh)
Wd	Seaweed
WD	Wire Drag
WDS	Wire Drag Surveys
WGS 84	World Geodetic System of 1984
WGS 72	World Geodetic System of 1972
wh	White (see also w)
Whf	Wharf
WHIS	Fog whistle
Wk	Wreck
Wks	Wrecks, wreckage
W'ly	Westerly
W Or	White and orange

X

None

Y

Y	Yellow (see also yl)
yd, yds	Yard(s)
yl	Yellow (see also Y)

Z

None

°	Degree
'	Minute (of arc); feet
"	Second (of arc); inches

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APPENDIX III - SYMBOLOGY

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NAUTICAL CHART MANUAL

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NAUTICAL CHART MANUAL

APPENDIX III

SYMBOLOGY

Nautical Chart Screen Standards

Black 001

Chart outlines (NOS charts only)	25%	200LPI	Biangle
Contiguous Zone	25%	200LPI	Biangle
Exclusive Economic Zone	25%	200LPI	Biangle
Fishery Conservation Zone	25%	200LPI	Biangle
Natural Resources Boundary	25%	200LPI	Biangle
Territorial Sea	25%	200LPI	Biangle
Black depth curves	49%	200LPI	Biangle
LORAN C (Y rate)	49%	200LPI	Biangle
OMEGA A (third rate)	49%	200LPI	Biangle

Magenta 430

Cable area	20%	120LPI	
Cable ferries	20%	120LPI	
Danger area	20%	120LPI	
Sea lanes	20%	120LPI	
Metric label	40%	120LPI	

Blue 320

Blue tint #2	3%	120LPI	
Blue tint #1	8%	120LPI	
Civil reservation screen	10%	120LPI	
Chart outlines (DMA charts only)	33%	200LPI	Biangle
Blue depth curves	49%	200LPI	Biangle

Gold 117

Land tint	20%	120LPI	
Cities (urban tint)	30%	120LPI	
Chart outlines (foreign charts)	33%	200LPI	Biangle

Green 225

Wire drag	8%	120LPI	
Anchorage (berths)	49%	200LPI	Biangle
Square green daybeacons	50%	120LPI	
Low Water; Marsh; Ledge	Gold 20%, Blue 8%,	120 LPI (land tint) overprinted on 120 LPI (shoal water tint)	

Features by Line Weights

Line Weight/Dash Length/Space	Feature
Solid Lines	
.004"	Depth curves Intermediate topo contour line
.006"	Man-made shoreline Pier Bulkhead; wharf Apparent shoreline Range line, navigable portion
.008"	Anchorages: general; special; temporary Index topo contour line
.010"	Natural shoreline Single line drainage
Dashed Lines	
.004"/.040"/.020"	Approximate depth curve Approximate topo contour
.004"/.24"/.060"	LORAN baseline extension
.006"/.030"/.016"	Light sector ray line Submerged ruins
.006"/.050"/.020"	Limits: marsh; mangrove; grass; lava Overhead cable, telephone

	Sewer
	Under construction
	Submerged breakwater, jetty, marine railway
	Range line, non-navigable portion
.008"/.080"/.030"	Miscellaneous marine limits
	Areas: cable; pipeline; spoil; disposal; dumping
	Anchorages: explosive; prohibited; forbidden
.010"/.080"/.030"	Approximate shoreline
	Miscellaneous dredged areas
	Channel edge limits, narrow
.010"/.160"/.040"	Channel edge limits, medium (100' to 400')
	Danger
.010"/.240"/.060"	Channel edge limits, wide

Dotted Lines

Dot Diameter/Dot
Spacing - Center to Center

.010"/.025" (Dot diameter/dot spacing, center to center)

	Low water line
	Danger curve

Standard Linear Symbol Specifications

Solid Lines

	INCHES	MILLIMETERS
1.	0.004	0.10
2.	0.006	0.15
3.	0.008	0.20
4.	0.010	0.25

		0.012	0.30
5.		0.016	0.40
6.		0.020	0.50
	a.	0.025	0.60
	b.	0.030	0.75
	c.	0.040	1.00
	d.	0.050	1.25
	e.	0.060	1.50

Dashed Lines (lineweight/dash length/space)

7.	.004/.040/.020	0.10/1.0/0.5
	.004/.240/.060	0.10/6.0/1.5
8.	.006/.030/.016	0.15/0.75/0.4
9.	.006/.050/.020	0.15/1.25/0.5
10.	.008/.080/.030	0.20/2.0/0.75
11.	.010/.080/.030	0.25/2.0/0.75
12.	.010/.160/.040	0.25/4.0/1.0
13.	.010/.240/.060	0.25/6.0/1.5
	.012/.050/.020	0.30/1.25/0.5
14.	.020/0.10/.030	0.5/2.5/0.75

Dotted Lines (dot diameter/spacing)

15.	.010/.025	0.25/0.6

Solid Borders

16.	.035	0.9
17.	.040	1.0
18.	.060	1.5

Circles (lineweight/radius)

19.	.008/.140	0.20/3.55
20.	.006/.046	0.15/1.18
21.	.006/.020	0.15/0.5
22.	.010/.016	0.25/0.4
23.	.006/.012	0.15/0.3
24.	.006/.016	0.15/0.4

Dots (diameter)

25.	0.010	0.25
26.	0.030	0.75

~ ~ ~ ~ ~ ~ ~ ~

Standard Features Specification Group

1. Solid Lines (lineweight)

0.10 mm (0.004")

Chart diagram neatline
Chart neatline
Contour line, intermediate (topographic)
Cross hatch
Depth curve
Depth curve bordering blue tint
LORAN line
OMEGA line
Projection line
Road, improved (double lined)
Tint outline
Traffic Lane Precautionary Area (outline for screen)

0.15 mm (0.006")

Breakwater
Bridge detail, including fenders
Building outlines
Bulkhead
Canal, minimum size (double-line)
Crab pen
Crib, bare at shoreline datum (to scale)
Dam
Dry dock
Ditch
Double line roads
Fish netting area limits
Floating drydock
Fort

Groin
Hulk (to scale)
Jetty
Light sector arcs (magenta)
Lock
Oil and Gas Lease Block Boundary
Pavement detail
Pier
Range line, navigable portion
Romp
Runway
Shoreline, apparent
Shoreline, manmade
Structure, large, hatchured (to scale); structure, visible (generally detached from shoreline)
Tunnel (above spor)
Tunnel entrance
Wharf

0.20 mm (0.008")

Anchorage, commercial
Anchorage, general
Anchorage, military
Anchorage, seaplane
Anchorage, special
Anchorage, temporary
Course lines (small-craft charts)
Isogonic lines
Oil and Gas Lease Block Boundary
Nonanchorage
Recommended tracker (marked by aids)
Sea plane landing area
Statute mile indicators (2.0 cm in length)
Temporary anchorage
Topographic contour line, index
Topographic index contours

0.25 mm (0.010")

Channel reach separator
Chart outlines
Drainage, perennial (single-line)
Operating area
Natural shoreline
Single line breakwater
Submarine operating area
Statute mile marker
Surface operating area

0.30 mm (0.012")

Roads, improved (single-line)

0.40 mm (0.016")

Exclusive Economic Zone boundary
Fishery Conservation Zone boundary
Oil and Gas Lease Area Boundary

0.50 mm (0.020")

Closing line (territorial sea)
Fairway anchorage
Safety fairway
Three-league line (natural resources boundary)
Three-mile line (territorial sea)
Twelve-mile line (contiguous zone)

2. Dashed Lines (lineweight/dash length/space)

0.1/1.0/0.5 mm (0.004"/0.040"/0.020")

Approximate topographic contour
Approximate depth curve
State grid ticks (3 dashes)

0.1/6.0/1.5 mm (0.004"/0.24"/0.060")

LORAN baseline extension

0.15/0.75/0.40 mm (0.006"/0.030"/0.016")

Building in ruins
Containment structures
Crib covered at shoreline datum (to scale)
Fence
Footpath
Hyacinth boom
Jetty, submerged or under construction
Light sector ray line
Log boom
Oil barrier

Piers and other berthing structures in ruins or below spor
Row of pilings or posts
Ruins, visible (to scale)
Ruins, submerged
Submerged tunnel
Trail
Tunnel (dashed portion)

0.15/1.25/0.50 mm (0.006"/0.050"/0.020")

Airport limit
Breakwater portion covered at shoreline datum or under construction
Bridge under construction
Burrow area
Cable ferry
Cypress area limit
Dams
Ferry crossing route
Fish haven area limit
Floodgates
Glacier area limit
Grass area limit
Groin portion covered at shoreline datum
Hulk covered at sounding datum (to scale)
Jetty portion covered at shoreline datum
Lava area limit
Light sectors arcs
Mangrove area limit
Marine railway portion covered at shoreline datum
Marsh area limit
Measured mile line
Miscellaneous topographic area limit
Overhead cables, miscellaneous (cable car, guy wire, power, telephone, etc.)
Pipeline, overhead
Ramp portion covered at shoreline datum
Range line, nonnavigable portion
Revetment area limit
Sand dune area limit
Salt water intrusion barrier
Sewer area limit
Sills
Swamp area limit
Under construction area limit

0.20/2.00/0.75 mm (0.008"/0.080"/0.030")

Anchorage, explosive
Anchorage, forbidden
Anchorage, general (regulated)
Anchorage, private (non-CFR, black)
Anchorage, prohibited
Anchorage, quarantine
Anchorage, restricted
Anchoring berth, military (non-CFR, green)
Anchoring berth, nonmilitary (non-CFR, black)
Alternate course line (magenta)
Alternate course line (black)
Approximate topographic index contour
Cable area
COLREGS demarcation line
Course lines (conventional charts)
Degaussing range
Deepwater Port Safety Zone limit
Disposal area
Dump site
Isogonic line
Living resources area limit
Maritime area (black)
Maritime limit (magenta); regulated area
Military dumping areas
Mineral resources area limit
Oil transfer area limit
Oyster bed limit
Pipeline area
Recommended tracks (not marked by aids)
Security zone
Spoil area
Submarine tunnel areas
Swimming area
Unsurveyed area
Volcano and submarine volcano area
Wire-drag and swept area (inner limit)

0.25/2.00/0.75 mm (0.010"/0.080"/0.030")

Channel edge limits (less than 100' wide)
HWL, approximate shoreline
Miscellaneous dredged areas

0.25/4.00/1.00 mm (0.010"/0.160"/0.040")

Channel edge limits (100' to 400' wide)
Missile test area, firing area, exercise area
Regulated danger area
Wire-drag area (outer limit)

0.25/6.00/1.50 mm (0.010"/0.240"/0.060")

Channel edge limits (over 400' wide)

0.30/1.25/0.50 mm (0.012"/0.050"/0.020")

Bridge under construction (single line)

0.50/2.50/0.75 mm (0.020"/0.100"/0.030")

Deepwater Port Safety Zone (in conjunction with traffic scheme)
Traffic separation scheme (outer limit)

3. Dotted Lines (diameter of dot/spacing between dots center to center)

0.25/0.60mm (0.010"/0.025")

Danger curve (shallow area)
Danger limit line, vessel wreckage, submerged
Danger limit line, unregulated area
Danger limit line, natural feature (submerged reef, ledge, coral, foul)
Fish trap, weir
Fish haven (to scale)
Kelp area limi
Low water line
Oyster bars, dangerous to surface navigation
Shallow area

4. Crossed Dashed Line

0.25/2.00/0.75 mm (0.010/0.080/0.030") with perpendicular cross (l.00 mm/0.040") centered on each dash

State plane boundary

5. "T" Dashed Line

0.20/2.00/0.75 (0.008/0.080/0.030")

Restricted area

6. Long-short Dashed Line (lineweight/long dash/space/short dash)

0.15/8.00/1.00/1.50 mm (.006"/0.32"/.040"/.006")

Civil Reservation limit
Military installation limit
State plane boundary

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APPENDIX IV - MISCELLANEOUS REFERENCES

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Office of Coast Survey

NAUTICAL CHART MANUAL

Appendix IV: Miscellaneous References

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REVISED MAY 29, 2003

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 011/03 May 30, 2003

FILE WITH NAUTICAL CHART MANUAL, VOLUME 2, APPENDIX IV

TO: All Cartographers
Marine Chart Division

SUBJECT: Samples: Margin and Border Note Formats; Small-Craft Chart and Cover Formats

APPLICATION: Nautical Chart Manual

Effective immediately, the attachment replaces pages IV-5 through IV-16 in the Nautical Chart Manual, Volume 2, Appendix IV, Seventh (1992) Edition.

The attachment revises pages IV-5 through IV-16 by:

1. updating the existing samples of margin and border note formats
2. adding new samples of pocket fold margin and border note formats,
3. adding a sample of a folio chart cover panel, and,
4. improving the sample graphics for small-craft chart formats, cover formats and minute breakdown for small-craft charts with skewed projection.

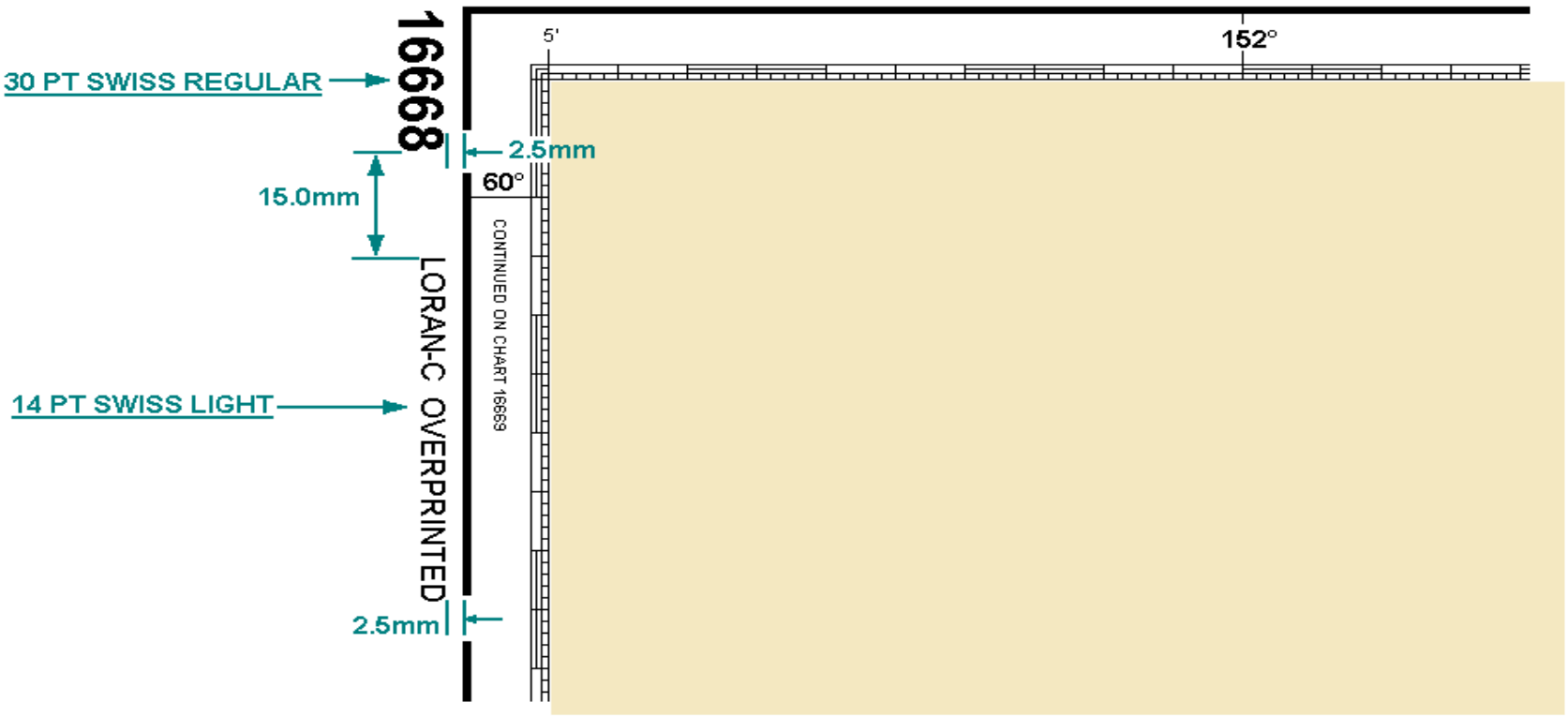
The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Appendix IV, Seventh (1992) Edition, immediately after page IV-4.

Attachment

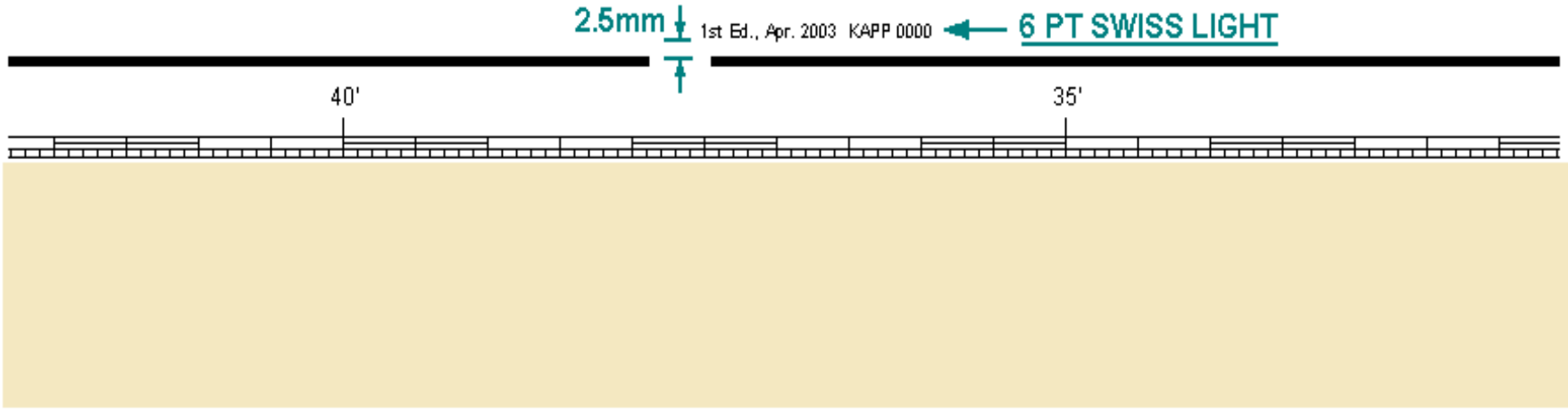
Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

Sample of Margin and Border Note Formats - Upper Margin

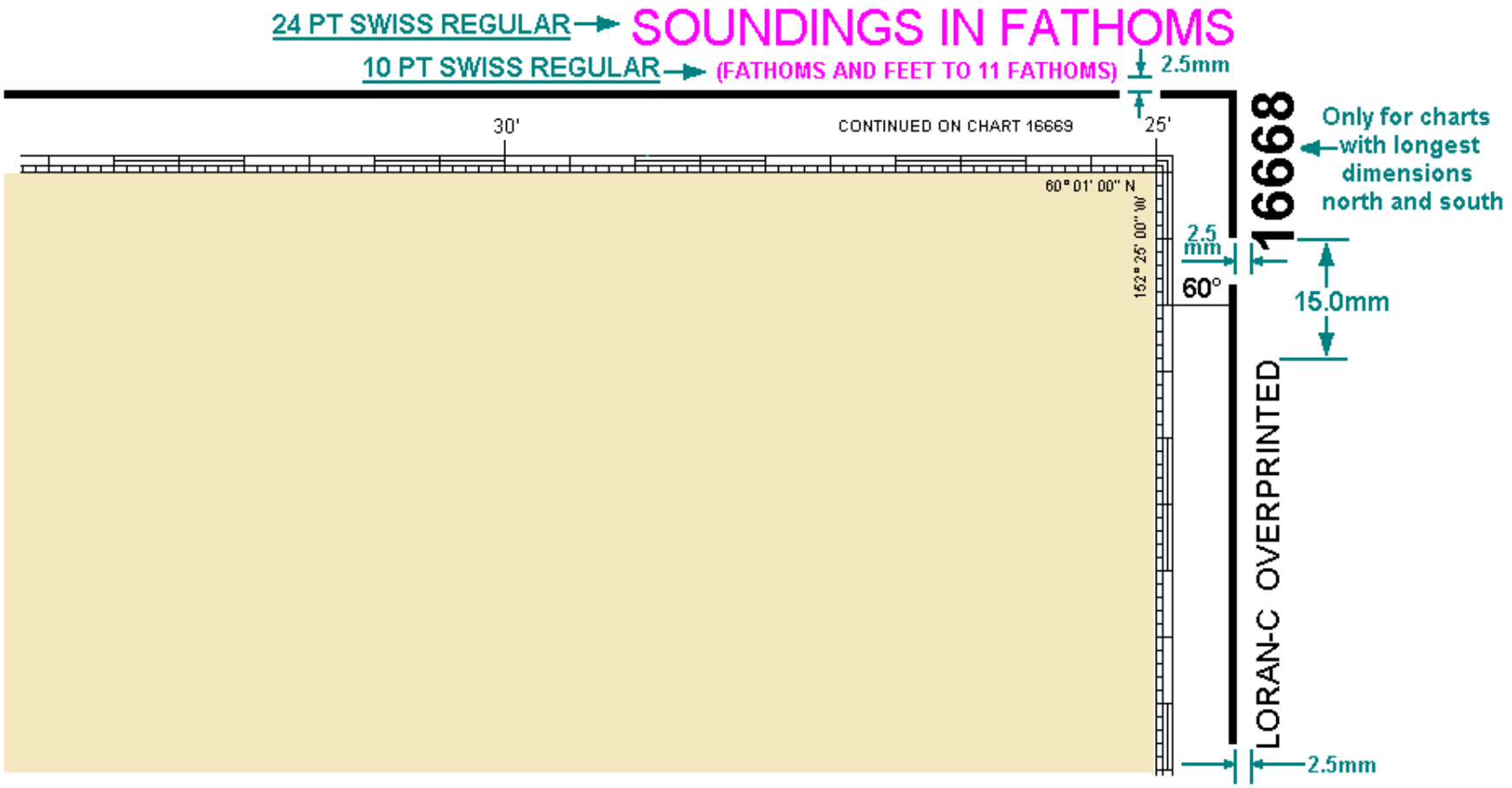
UPPER MARGIN NOTES - LEFT SIDE



UPPER MARGIN NOTES - CENTER

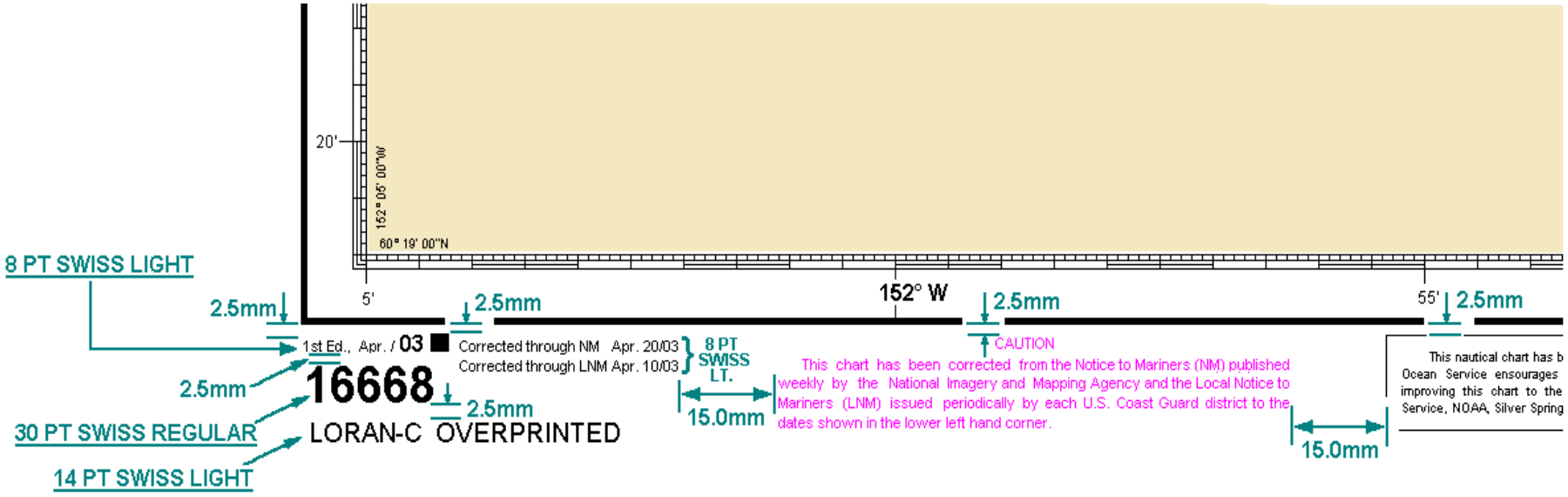


UPPER MARGIN NOTES - RIGHT SIDE

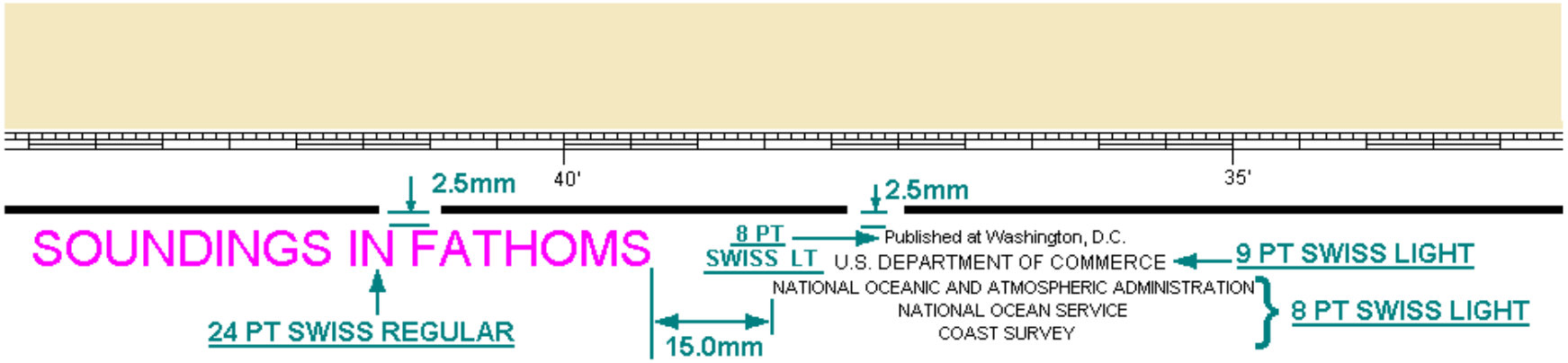


Sample of Margin and Border Note Formats - Lower Margin

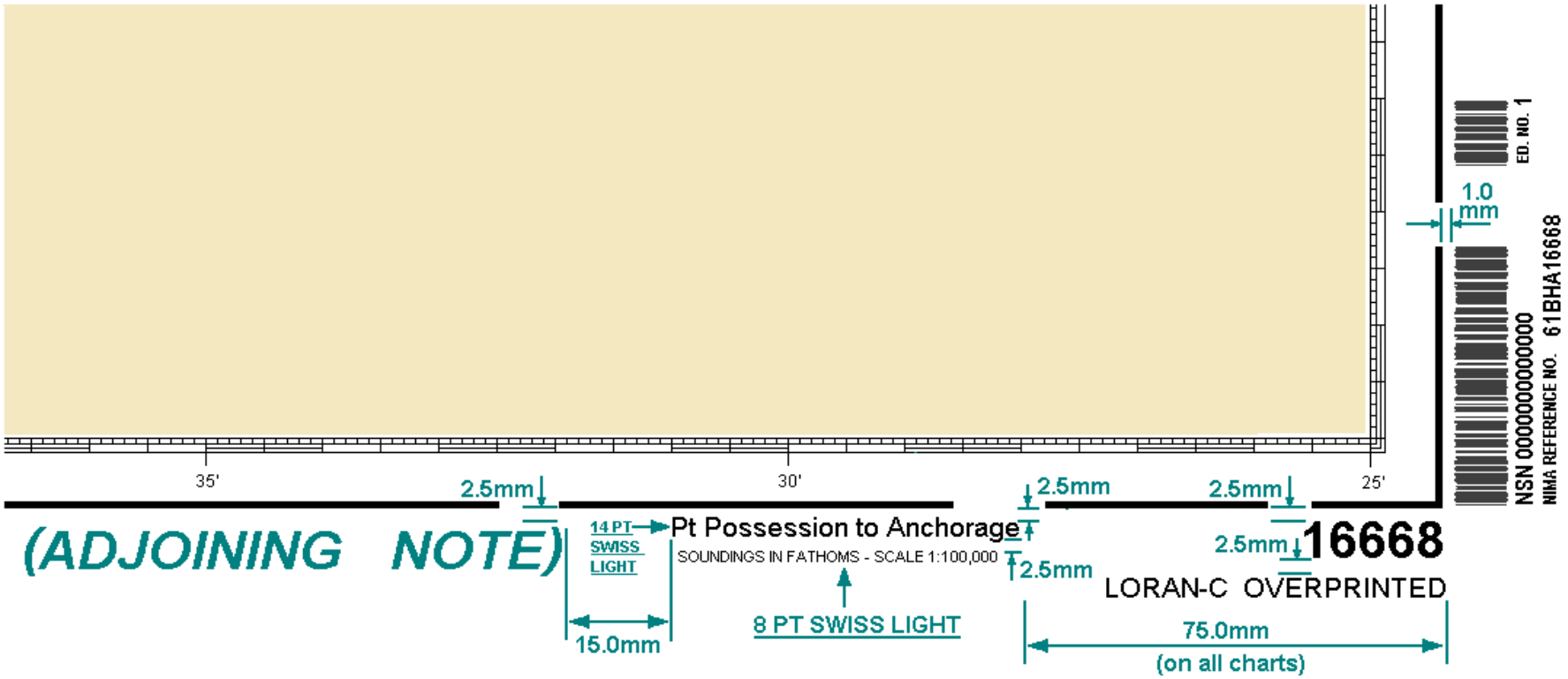
LOWER MARGIN NOTES - LEFT SIDE



LOWER MARGIN NOTES - CENTER



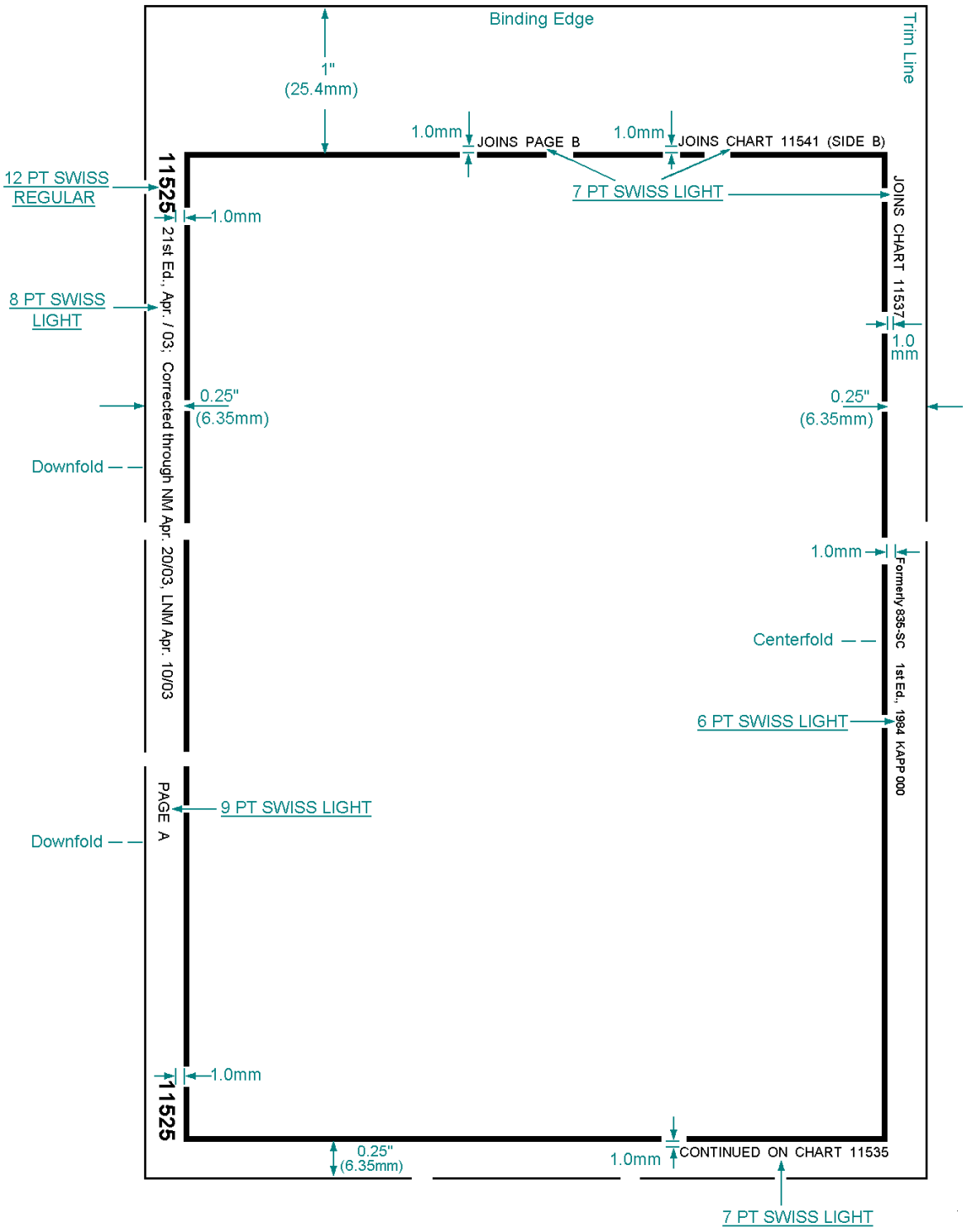
LOWER MARGIN NOTES - RIGHT SIDE



* CHART IS NOT SHOWN TRUE TO SCALE

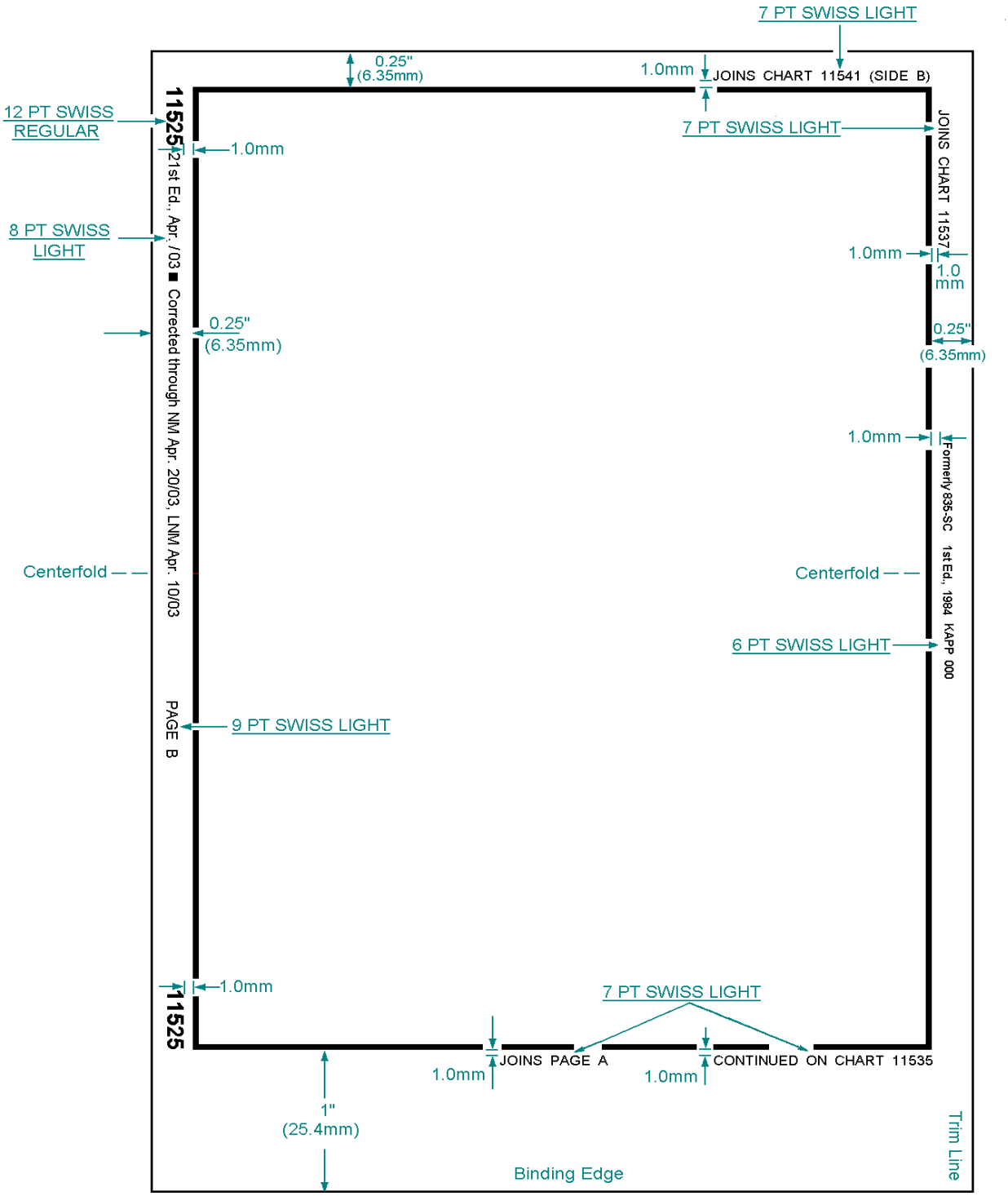
NAUTICAL CHART MANUAL

Margin Notes
Sample of Small-Craft Folio Chart Page Format
Page A (Front)

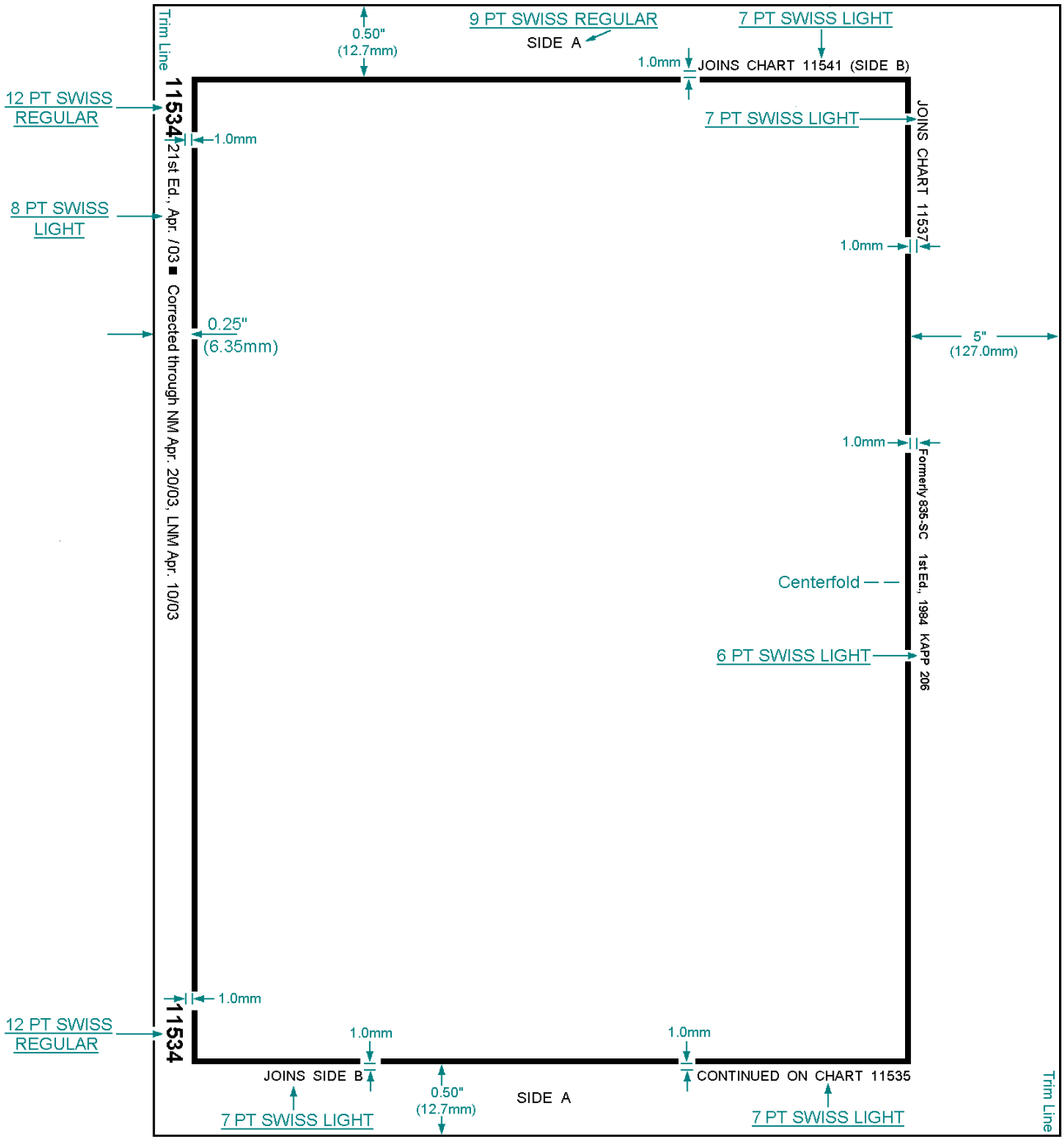


REVISED MAY 30, 2003

Margin Notes
Sample of Small-Craft Folio Chart Page Format
Page B (Back)

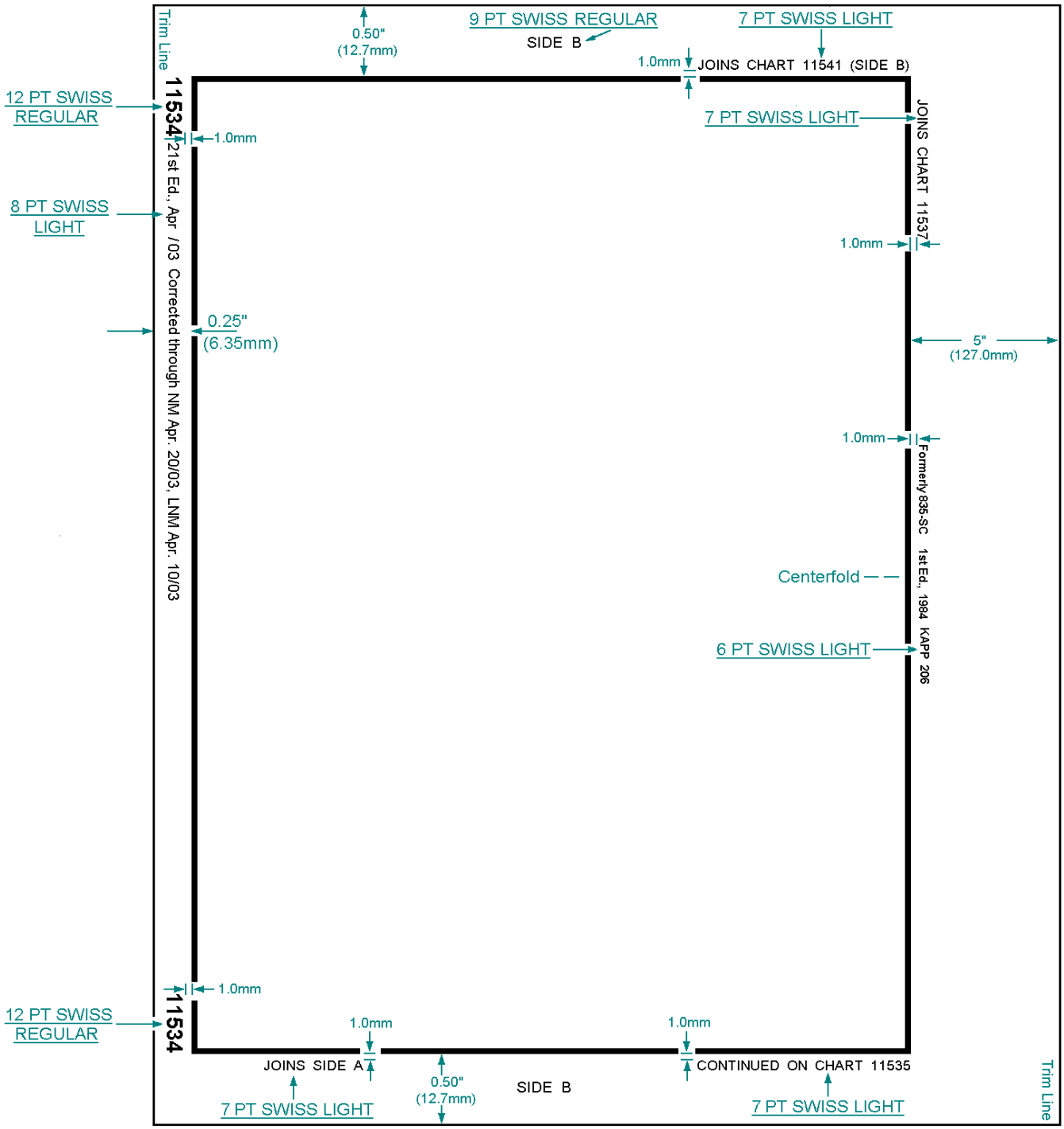


Margin Notes
Sample of Small-Craft Pocket Fold Side Format
Side A (Front)



REVISED MAY 30, 2003

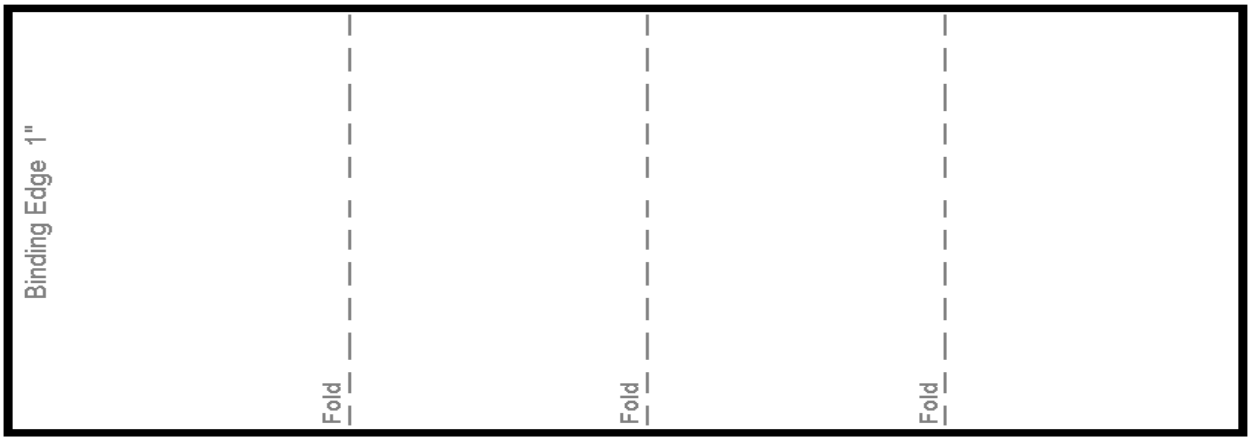
Margin Notes
Sample of Small-Craft Pocket Fold Side Format
Side B (Back)



SMALL-CRAFT CHART (AND COVER) FORMATS

FOLIO CHART FORMAT

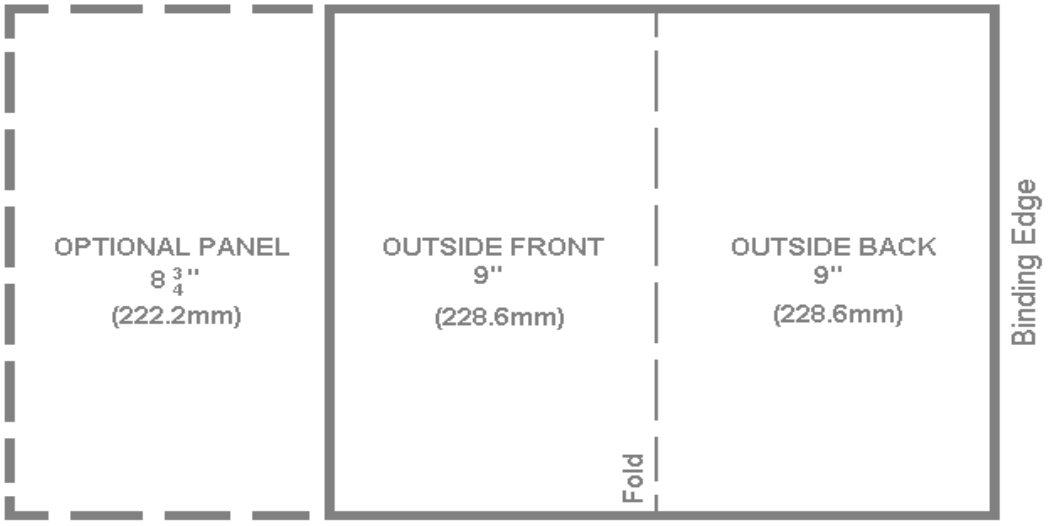
Description: These small- craft charts consist of two to four sheets printed front and back, accordian-folded, and bound in a protective cardboard jacket.



TRIM : $14\frac{1}{2}$" x $32\frac{3}{4}$" (368.0mm x 831.85mm)

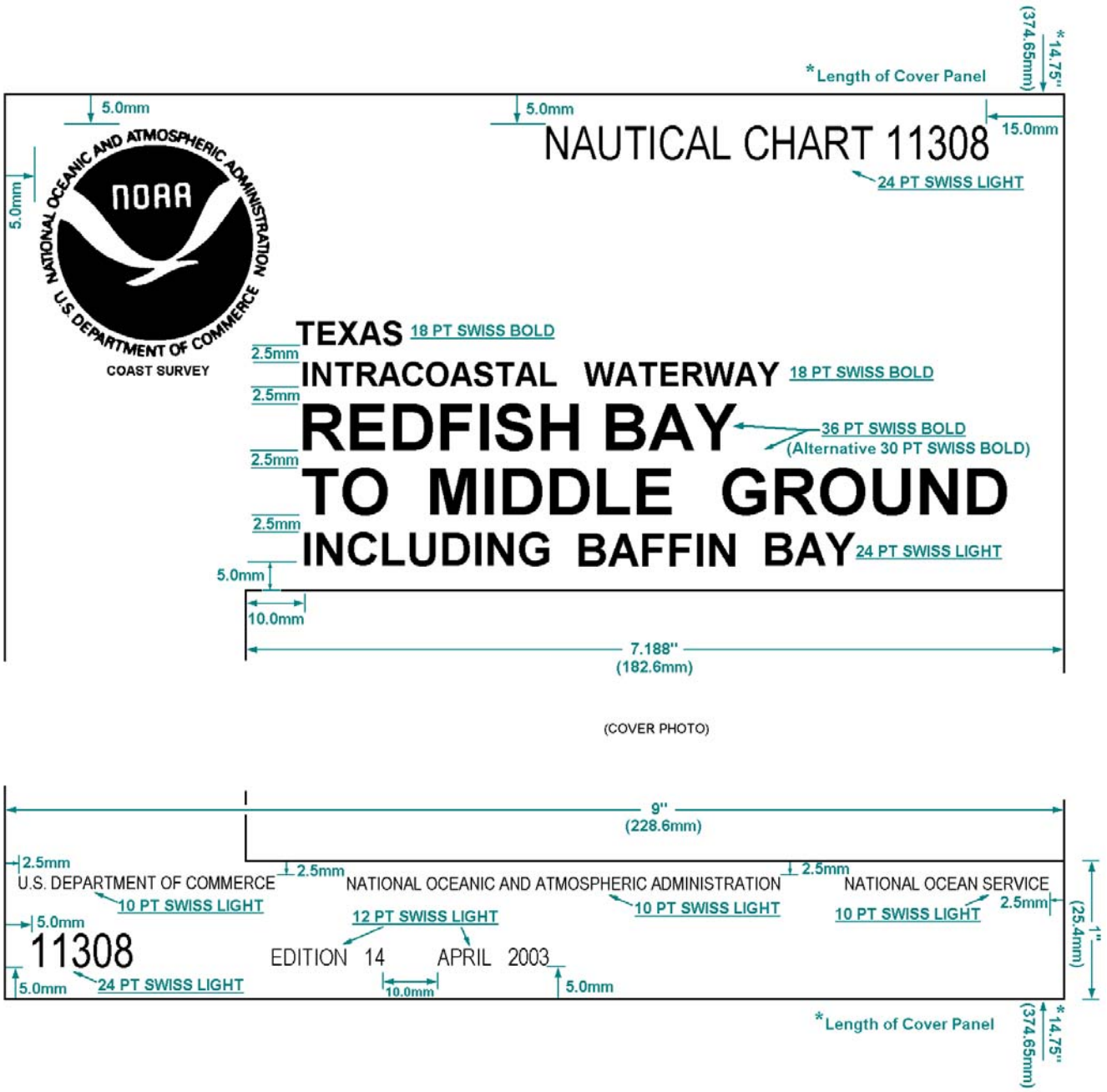
PANELS : $8\frac{3}{4}$", 8", 8", 8" x $14\frac{1}{2}$" (222.2mm, 203.2mm, 203.2mm, 203.2mm, 368.0mm)

FOLIO CHART COVER FORMAT



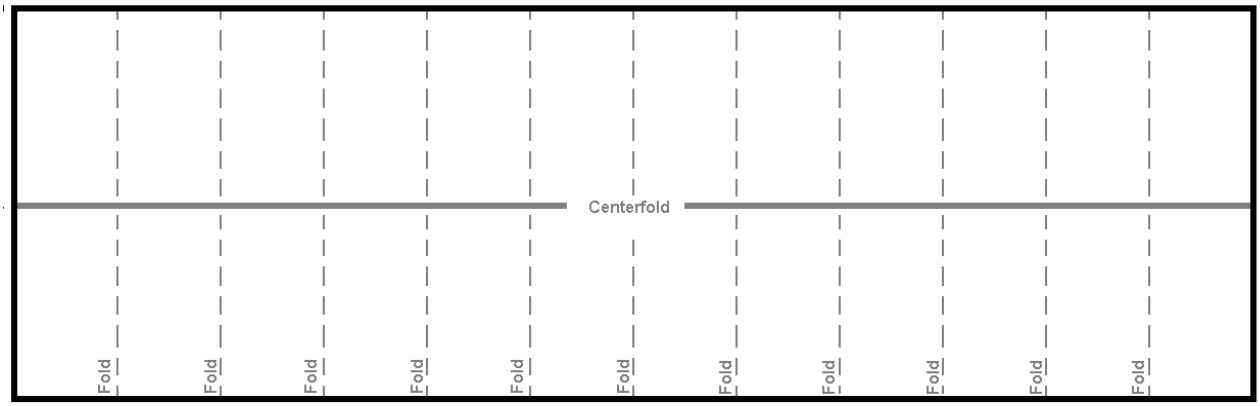
COVER TRIM SIZE: $14\frac{3}{4}$" x 18" (374.6mm x 457.2mm)

Sample of Folio Chart Cover Panel



POCKET FOLD CHART FORMAT

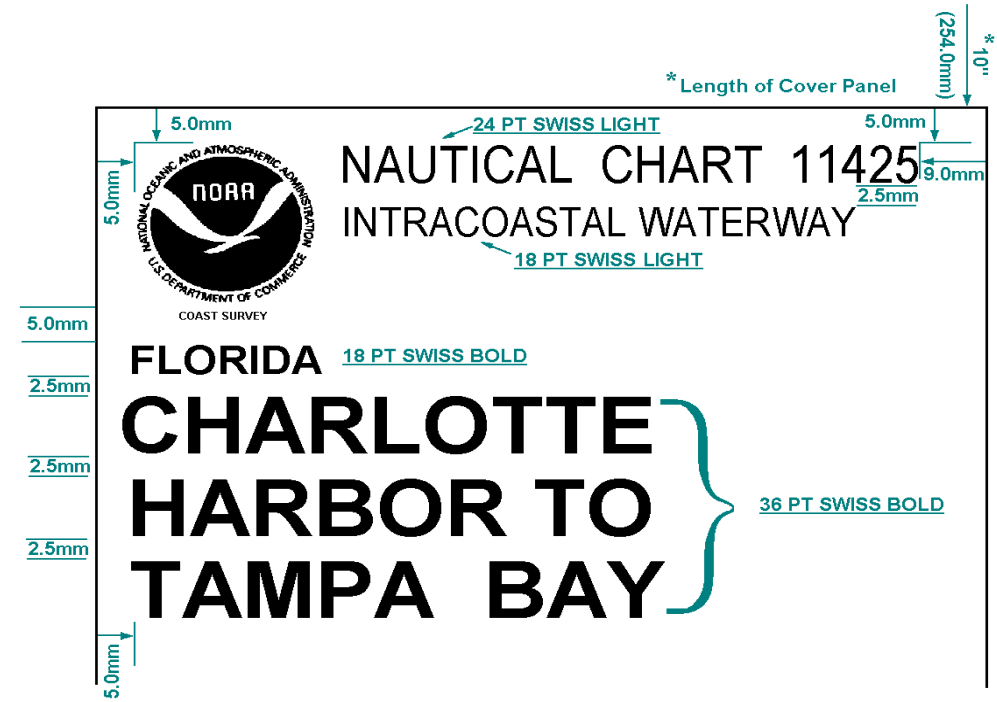
Description: These small-craft charts consist of one sheet printed front and back; folded (1) on a horizontal axis (i.e. centerfold) and (2) in an accordian-folded format on the vertical axis. Pocketfold charts are NOT issued in a protective cardboard jacket.



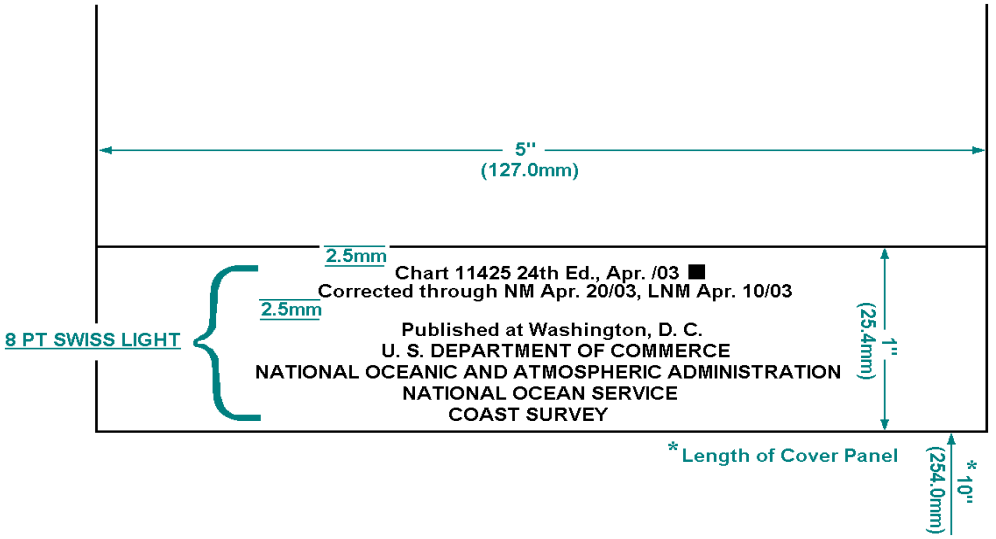
TRIM: 20" x 59" (508.0mm x 1498.6mm)
PANELS: 5" x 10" (127.0mm x 254.0mm) (Except for last fold)

(The remainder of this page is intentionally blank.)

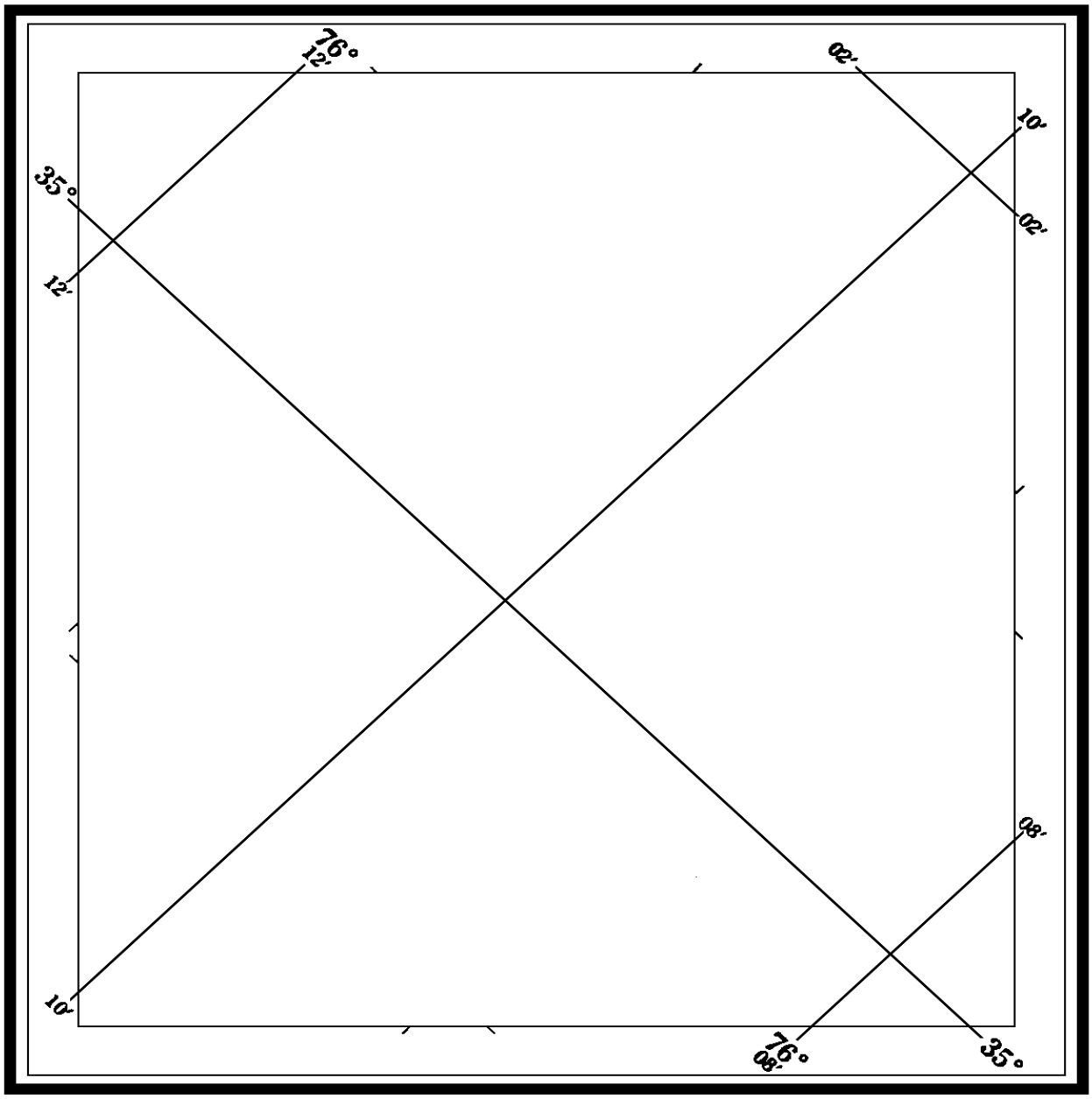
Sample of Small-Craft Pocket Fold Chart Cover Panel



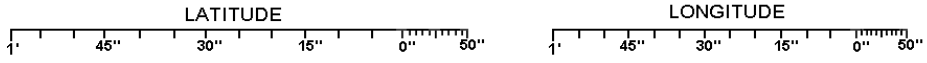
(COVER PHOTO)



Sample of Minute Breakdowns for Small-Craft Charts with Skewed Projections



SCALE: 1:40,000



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

DECEMBER 31, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Deletion of "2002 The Year of Clean Water" Logo

APPLICATION: All Affected Nautical Charts and Catalogs

Reference: Cartographic Order 002/02; dated January 17, 2002; SUBJECT: "2002 The Year of Clean Water" Logo.

The application of the above referenced documentation to nautical charts and chart catalogs expires at the close of business on December 31, 2002. Please remove and discard the referenced documentation located in the Nautical Chart Manual, Seventh (1992) Edition, Volume 2, Appendix IV.

"2002 The Year of Clean Water" Logos displayed on current edition nautical charts and chart catalogs shall be deleted prior to the next printing of those products.

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 024/00 May 17, 2000

File With Nautical Chart Manual Volume 2, APPENDIX IV, MISCELLANEOUS REFERENCES

TO: All Cartographers
Marine Chart Division

SUBJECT: Standard Notes

APPLICATION: Nautical Chart Manual

Effective immediately, the attachment shall replace pages IV-17 through IV-20 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attached list of notes has been updated and enhanced to incorporate all the standard notes in the notes cell library. The notes are in the order that they appear in the cell library. Notes can be selected out of the cell library in Microstation/IrasB by using the file name shown directly above each note in this listing.

Not all notes that are used on NOS charts are in the notes cell library. If a cartographer needs to create a note he or she should use the notes template, also available in the notes cell library. Standard notes should be in 7 point Swiss Light type.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

NAUTICAL CHART MANUAL

Standard Notes

The following notes are in the notes cell library on the SCARS/CAC homepage at http://ocsnet.ncd-tcn.noaa.gov/mcd/scars/scars.htm under cell libraries Check there for updates.

The notes are in the order that they appear in the cell library.

Notes can be selected out of the cell library in Microstation/IrasB by using the file name shown directly above each note in this listing.

Not all notes that are used on NOS charts are in the notes cell library. If the cartographer needs to create a note he or she should use the notes template, also available in the notes cell library. Standard notes should be in 7 point Swiss Light type.

List of notes by title or category:

Note Titles and Categories

12 Nautical Mile Territorial Sea Limit - Note X
Abbreviations
Acknowledgment
Adopt-A-Chart Acknowledgment
Aids to Navigation
Area to be Avoided
Articulated Aids
Authorities
Avoid Large Vessels - Warning to Small Craft
Bascule Bridge Clearances
Bridge Construction
Buoy M Precautionary Area
Buoy PE Precautionary Area
Cable and Pipeline Areas
Caution Notes, General
Changes in Buoyage
Channel Controlling Depth available on larger scale
Channel Legend shows Project Depth
Channel Markers on the ICW
Chart No. 1, For Symbols and Abbr
Chesapeake Bay Tributaries
Co-op Charting Acknowledgment: Adopt-A-Chart
Coast Pilot Supplemental Information
COLREG
COLREG lines follow...

Comments Request Note
Consult Light List for Supplemental Info - Aids to Navigation
Coordinate Grid
Copyright Note
Corrections Note (call for corrections /Comments Request Note)
Corrections Note (update with WN, LNM)
Courses Sailing
Critical Habitat for the Right Whale
Datum Note
Determination of Wind Speed
Edges of Improved Channels
Facilities Note
Fish Trap Area Boundary Line
Fish Trap Areas and Structures
Fish Traps and Stakes - Numerous Reported
Fishing and Hunting Structures
For Symbols and Abbreviations...
Great Lakes Note Block - Notes (Plane of Reference)
Great Lakes Periodic High Water Cond.
Great Lakes Sailing Courses
Heights
High Water Conditions in Great Lakes
Horizontal Datum
Hurricanes and Tropical Storms
IALA Changes in Buoyage
ICW Channel Markers
Improved Channels, Edges of
Intracoastal Waterway Aids
Intracoastal Waterway Depths & Distances
IWW Channel Markers
Large Vessels Caution Note
Light List for Supplemental Info - Aids to Navigation
Local Magnetic Disturbance
Loran-C Notes
Marine Radiobeacon Caution Note
Marine Sanctuary Note - The Monitor
Military Craft Caution
Mineral Development Structures
Monitor National Marine Sanctuary
National Marine Sanctuary Note - Monitor
Natural Scale Varies
Navigation Regulations Note A

Nearshore waters of the Chesapeake Bay
NOAA Weather Broadcast Notes
Northern Right Whale Critical Habitat
Note _: (various topics)
Note _: Precautionary Area
Note _: Monitor National Marine Sanctuary
Note _: VTS notes
Note A - Navigation Regulations
Note Block, Great Lakes - Notes (Plane of Reference)
Note S - Regulations for Ocean Dumping Sites
Note Template (7 Pt Type)
Note X - 12 Nautical Mile Territorial Sea Limit
Notes (Plane of Ref etc.)
Numerous Fish Traps and Stakes Reported
Numerous Uncharted Rocks Shoreward of 10m Curve
Ocean Dumping Site Regulations - Note S
Offshore Navigation Only
Okeechobee Waterway Aids
Periodic High Water in Great Lakes
Pipelines and Cables Caution Note
Plane Coordinate Grid
Pollution Reports
Possible Unexploded Ordnance Note
Potable Water Intake IV- 20t
Precautionary Area for Buoy M
Precautionary Area for Buoy PE
Precautionary Area Note
Prudent Mariner Warning Note
Published at...
Racing Buoys
Radar Reflectors
Radiobeacon Caution Note
Region A & B Changes in Buoyage
Regulations for Ocean Dumping Sites - Note S
Right Whale Critical Habitat
Riprap Around Lights
Rocket Impact Area
Rocks Shoreward of 10m Curve
Rules of the Road (Abridged)
Sailing Courses
Sailing Directions
Scale Varies
See Chart No. 1, For Symbols and Abbr

Shoreward of 10m Curve
Skin Divers Flag
Small Craft Beware Water Turbulence
Small Craft Stay Clear of Large
Small Craft Warnings in Maryland
Source Diagram
Stakes, Piles, etc Along Channels
State Plane Coordinate Grid
Storm Warnings
Submarine Pipelines and Cables Caution Note
Supplemental Information (see Coast Pilot)
Supplemental Information (see Light List) - Aids to Navigation
Survey Platforms, etc. Around Lights
Temporary Changes or Defects
Territorial Sea Limit - Note X
Tidal Information (less than 1/2 ft)
Tide Rips and Currents in North Pacific
Tributaries, Caution in Chesapeake Bay - Nearshore Waters
U.S. Dept of Commerce...
Uncharted Rocks Shoreward of 10m Curve
Underwater Cables Area
Update from NIMA, LNM Note
Updating Service
Unexploded Ordnance Possible - Note ?
Unexploded Ordnance Warning
VTS Notes
Warning Notes - The Prudent Mariner, Unexploded Ordnance
Warning to Small Craft to Avoid Large Vessels
Warning to the Prudent Mariner
Weather Broadcast Notes
Weather Rocket Impact Area
Wind Speed Determination
Wire Dragged Areas

NAUTICAL CHART MANUAL

All note examples will be inserted at a future date.

REVISED MAY 17, 2000

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JULY 8, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Correction Pages, IV-20e and IV-20f

The following attachment replaces Page IV-20e and Page IV-20f in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment corrects the color (to black) of the Temporary Changes or Defects Notes.

Attachment

NAUTICAL CHART MANUAL

The affected pages will be inserted at a future date.

REVISED MAY 17, 2000

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JUNE 23, 2000

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Standard Notes

Effective immediately, the attachment replaces pages IV-20s and IV-20t in the Nautical Chart Manual, Volume 2, Appendix IV, Seventh (1992) Edition.

The Plane Coordinate Grid Note (PLCOGD) should be Swiss Light type.

NAUTICAL CHART MANUAL

The affected pages will be inserted at a future date.

REVISED MAY 17, 2000

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JUNE 19, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: APPENDIX IV: Proportional Divider Settings; Light Characteristic Phases

Effective immediately, the following attachment replaces pages IV-21 and IV-22 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment:

1. Improves and clarifies the values provided in the Proportional Divider Settings Table

2. Improves and updates the Illustration of Light Characteristic Phases.

The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Seventh (1992) Edition, immediately after page IV-20z in APPENDIX IV: MISCELLANEOUS REFERENCES.

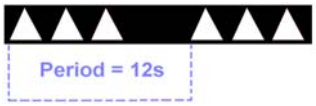
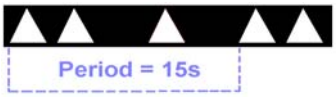
NAUTICAL CHART MANUAL

Proportional Divider Settings

	Chart Scale:	**1/2500**	**1/5000**	**1/10,000**	**1/15,000**	**1/20,000**	**1/25,000**	**1/30,000**	**1/40,000**	**1/80,000**
Feet to the inch	**Natural Scale**									
1" = 50'	1:600	387	214							
1" = 60'	1:720	447	252							
1" = 80'	1:960	555	322	175						
1" = 100'	1:1200	649	387	214						
1" = 200'	1:2400	979	649	387	276	214	175			
1" = 300'	1:3600		837	529	387	305	252	214		
1" = 400'	1:4800		979	649	485	387	322	276	214	
1" = 600'	1:7200			837	680	530	447	387	305	
1" = 800'	1:9600			979	781	649	555	485	387	214
1" = 1000'	1:12,000		589	909	889	750	649	572	462	261
1" = 83 1/3'	1:1000	571	333	182						
1" = 166 2/3'	1:2000	888	571	333	235	182				
1" = 250'	1: 3000		750	461	333	261	214	182		
1" = 333 1/3'	1:4000		888	571	421	333	276	235	182	
1" = 416 2/3'	1:5000			667	500	400	333	286	222	
1" = 500'	1:6000		909	750	571	461	387	333	261	
1" = 833 1/3'	1:10,000				800	667	571	500	400	222
1" = 1041 2/3'	1:12,500				909	769	667	589	476	270
1" = 1250'	1:15,000					857	750	667	545	316
1" = 1666 2/3'	1:20,000						889	800	667	400
1" = 2000'	1:24,000		345	588	769	909	980	889	750	462
1" = 2083 1/3'	1:25,000							909	769	476
1" = 2604 1/6'	1:31,250		276	485	649	781	889	980	877	562
1" = 5208 1/3'	1:62,500			276	387	485	572	649	780	877
1" = 8000'	1:96,000			188	271	345	413	476	588	910
1" = 10,416 2/3'	1:125,000				214	276	333	387	485	780

NAUTICAL CHART MANUAL

Illustration of Light Characteristic Phases

TYPE	ABBREVIATION	GENERAL DESCRIPTION	ILLUSTRATION
Fixed	F	A continuous steady light	
Flashing	Fl	A light showing a single flash; and for which the total duration of light in a period is shorter than the total duration of darkness. The appearances of light (flashes) are usually of equal duration (at a rate of less than 30 flashes per minute).	
Fixed and flashing	F Fl	A light for which a fixed light is combined with a flashing light of greater luminous intensity.	
Group flashing	Fl (3)	A flashing light for which a group of flashes, specified in number, is regularly repeated.	
Composite group flashing	Fl (2+1)	A light similar to a group flashing light except that successive groups in a period have different numbers of flashes.	
Quick flashing	Q	A quick light for which a flash is regularly repeated.	
Group quick flashing	Q (3)	A light for which a specified group of flashes is regularly repeated.	
Interrupted quick flashing	I Q	A light for which the sequence of quick flashes is interrupted by regularly repeated eclipses of constant and long duration.	

TYPE	ABBREVIATION	GENERAL DESCRIPTION	ILLUSTRATION
Isophase	Iso	A light for which all durations of light and darkness are clearly equal.	
Occulting	Oc	A light in which the total duration of light in a period is longer than the total duration of darkness and the intervals of darkness (eclipses) are usually of equal duration.	
Group occulting	Oc (2)	An occulting light for which a group of eclipses, specified in number, is regularly repeated.	
Composite group occulting	Oc (2+1)	A light similar to a group occulting light except that successive groups in a period have different number of eclipses.	
Morse code	Mo (U)	A light for which appearances of light of two clearly different durations (dots and dashes) are grouped to represent a character or characters in the Morse Code.	
Alternate light	Al	A light showing different colors alternately. NOTE: Alternating lights may be used in combined form with most of the previous types of lights. For example: Al Fl - Alternating flashing Al F Fl - Alternating fixed and flashing Al F Fl(2) - Alternating fixed and group flashing Al Fl(2) - Alternating group flashing Al Oc - Alternating occulting	 Al RW

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JUNE 20, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: APPENDIX IV: Map Scales and Equivalents

Effective immediately, the following attachment replaces pages IV-23 and IV-24 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment serves to correct several values and formulas provided in the Map Scales and Equivalents Table.

The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Seventh (1992) Edition, immediately after page IV-22 in APPENDIX IV: MISCELLANEOUS REFERENCES.

Map Scales and Equivalents

(NOTE: The term "scale" as used in the formulas at the bottom of the table is the reciprocal of the fractional scale.)

Fractional Scale	Feet per Inch	Inch per 1000 Feet	Inches per Statute Mile	Statute Miles per Inch	Meters per Inch	Acres per Square Inch	Square Inch per Acre	Square Statute Mile per Square Inch
1:500	41.667	24.000	126.720	0.008	12.700	0.0399	25.091	0.000
1:1,000	83.333	12.000	63.360	0.016	25.400	0.1594	6.273	0.000
1:1,200	100.000	10.000	52.800	0.019	30.480	0.2296	4.356	0.000
1:2,000	166.667	6.000	31.680	0.032	50.800	0.6377	1.568	0.001
1:3,000	250.000	4.000	21.120	0.047	76.200	1.4348	0.697	0.002
1:4,000	333.333	3.000	15.840	0.063	101.600	2.5508	0.392	0.004
1:4,800	400.000	2.500	13.200	0.076	121.920	3.6731	0.272	0.006
1:5,000	416.667	2.400	12.672	0.079	127.000	3.9856	0.251	0.006
1:6,000	500.000	2.000	10.560	0.095	152.400	5.7392	0.174	0.009
1:8,000	666.667	1.500	7.920	0.126	203.200	10.2030	0.098	0.016
1:9,000	750.000	1.333	7.040	0.142	228.600	12.9132	0.077	0.020
1:10,000	833.333	1.200	6.336	0.158	254.001	15.9423	0.063	0.025
1:12,000	1000.000	1.000	5.280	0.189	304.801	22.9568	0.044	0.036
1:15,000	1250.000	0.800	4.224	0.237	381.001	35.8701	0.028	0.056
1:18,000	1500.000	0.667	3.520	0.284	457.201	51.6529	0.019	0.081
1:20,000	1666.667	0.600	3.168	0.316	508.001	63.7690	0.016	0.100
1:24,000	2000.000	0.500	2.640	0.379	609.601	91.8274	0.011	0.143
1:25,000	2083.333	0.480	2.534	0.395	635.001	99.6391	0.010	0.156
1:40,000	3333.333	0.300	1.584	0.631	1016.002	255.0760	0.004	0.399
1:48,000	4000.000	0.250	1.320	0.758	1219.202	367.3095	0.003	0.574
1:80,000	6666.667	0.150	0.792	1.263	2032.004	1020.3041	0.001	1.594
1:125,000	10416.667	0.096	0.507	1.973	3175.006	2490.9767	0.00040	3.892
1:250,000	20833.333	0.048	0.253	3.946	6350.013	9963.9067	0.00010	15.569
1:500,000	41666.667	0.024	0.127	7.891	12700.025	39855.6270	0.000025	62.274
1:1,000,000	83333.333	0.012	0.063	15.783	25400.050	159422.5079	0.0000063	249.098
Formulas:	$\frac{\text{Scale}}{12}$	$\frac{12{,}000}{\text{Scale}}$	$\frac{63{,}360}{\text{Scale}}$	$\frac{\text{Scale}}{63{,}360}$	Feet per inch x 0.3048006	$\frac{(\text{Scale})^2}{43{,}560 \times 144}$	$\frac{43{,}560 \times 144}{(\text{Scale})^2}$	$\frac{(\text{Feet per inch})^2}{5280^2}$

NAUTICAL CHART MANUAL

Map Scales and Equivalents

(NOTE: The term "scale" as used in the formulas at the bottom of the table is the reciprocal of the fractional scale.)

Fractional Scale	One Nautical Mile = Inches	Centimeters		One Statute Mile = Inches	Centimeters
1:2,500	29.165	74.080		25.344	64.372
1:5,000	14.583	37.040		12.672	32.186
1:10,000	7.291	18.520		6.336	16.093
1:15,000	4.861	12.347		4.224	10.729
1:20,000	3.646	9.260		3.168	8.047
1:30,000	2.430	6.173		2.112	5.364
1:40,000	1.823	4.630		1.584	4.023
1:50,000	1.458	3.704		1.267	3.219
1:60,000	1.215	3.087		1.056	2.682
1:80,000	0.911	2.315		0.792	2.012
1:100,000	0.729	1.852		0.634	1.609
1:200,000	0.365	0.926		0.317	0.805
1:400,000	0.182	0.463		0.158	0.402
1:500,000	0.146	0.370		0.127	0.322
1:100,0000	0.073	0.185		0.063	0.161
1:120,0000	0.061	0.154		0.053	0.134
Formulas:	$\frac{6076.11 \times 12}{\text{Scale}}$	$\frac{1852.0 \times 100}{\text{Scale}}$		$\frac{5280 \times 12}{\text{Scale}}$	$\frac{1609.3 \times 100}{\text{Scale}}$

A nautical mile is a minute of an average great circle of the earth, and its length is 6,076.11 feet, or 1852.0 meters.

A statute mile is 5,280 feet, or 1,609.3 meters.

One meter equals 39.37 inches; 1 centimeter equals 0.3937 inches; 1 inch equals 2.54 centimeters.

NAUTICAL CHART MANUAL

Distance of Visibility of Objects at Sea

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer whose eye is at sea level; in practice. In practice, therefore, it is necessary to add to these values, a distance of visibility corresponding to the height of the observer's eye above sea level.

Height (Feet)	Nautical Miles	Height (Feet)	Nautical Miles	Height (Feet)	Nautical Miles	Height (Feet)	Nautical Miles	Height (Feet)	Nautical Miles
6	2.8	65	9.2	380	22.3	900	34.4	6000	88.8
8	3.1	70	9.6	400	22.9	920	34.7	7000	96.0
10	3.6	75	9.9	420	23.5	940	35.2	8000	102.6
12	4.0	80	10.3	440	24.1	960	35.5	9000	108.7
14	4.3	85	10.6	460	24.6	980	35.9	10000	114.6
15	4.4	90	10.9	480	25.1	1000	36.2		
16	4.6	95	11.2	500	25.6	1200	39.6		
18	4.9	100	11.5	520	26.1	1400	42.9		
20	5.1	110	12.0	540	26.7	1600	45.8		
22	5.4	120	12.6	560	27.1	1800	48.6		
24	5.6	130	13.1	580	27.6	2000	51.2		
26	5.8	140	13.6	600	28.0	2200	53.8		
28	6.1	150	14.1	620	28.6	2400	56.2		
30	6.3	160	14.5	640	29.0	2600	58.5		
32	6.5	170	14.9	660	29.4	2800	60.6		
34	6.7	180	15.4	680	29.9	3000	62.8		
36	6.9	190	15.8	700	30.3	3200	64.9		
38	7.0	200	16.2	720	30.7	3400	66.9		
40	7.2	220	17.0	740	31.1	3600	68.6		
42	7.4	240	17.7	760	31.6	3800	70.7		
44	7.6	260	18.5	780	32.0	4000	72.5		
46	7.8	280	19.2	800	32.4	4200	74.3		
48	7.9	300	19.9	820	32.8	4400	76.1		
50	8.1	320	20.5	840	33.2	4600	77.7		
55	8.5	340	21.1	860	33.6	4800	79.4		
60	8.9	360	21.7	880	34.0	5000	81.0		

NAUTICAL CHART MANUAL

Linear Distance Conversion:
Fathoms - Meters - Feet - Yards

	Fathoms to…..		Meters to….			Feet to….		Yards to….
	Feet	Meters	Fathoms	Yards	Feet	Meters	Fathoms	Meters
1	6	1.82880	0.54681	1.09361	3.28083	0.30480	0.16667	0.91440
2	12	3.65761	1.09361	2.18722	6.56167	0.60960	0.33333	1.82880
3	18	5.48641	1.64042	3.28083	9.84250	0.91440	0.50000	2.74320
4	24	7.31521	2.18722	4.37444	13.12333	1.21920	0.66667	3.65761
5	30	9.14402	2.73403	5.46806	16.40417	1.52400	0.83333	4.57201
6	36	10.97282	3.28083	6.56167	19.68500	1.82880	1.00000	5.48641
7	42	12.80163	3.82764	7.65528	22.96583	2.13360	1.66667	6.40081
8	48	14.63043	4.37444	8.74889	26.24667	2.43840	1.33333	7.31521
9	54	16.45923	4.92125	9.84250	29.52750	2.74320	1.50000	8.22962

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JUNE 21, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: APPENDIX IV: Feet to Fathom Conversion Table

Effective immediately, the following attachment replaces pages IV-27 and IV-28 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment serves to correct several values and improve the representation of the Feet to Fathom Conversion Table.

The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Seventh (1992) Edition, immediately after page IV-26 in APPENDIX IV: MISCELLANEOUS REFERENCES.

Feet to Fathom Conversion Table

Feet	*to*	Fathoms	Feet	Feet	*to*	Fathoms	Feet	Feet	*to*	Fathoms	Feet
1		0	1	27		4	3	53		8	5
2		0	2	28		4	4	54		9	0
3		0	3	29		4	5	55		9	1
4		0	4	30		5	0	56		9	2
5		0	5	31		5	1	57		9	3
6		1	0	32		5	2	58		9	4
7		1	1	33		5	3	59		9	5
8		1	2	34		5	4	60		10	0
9		1	3	35		5	5	61		10	1
10		1	4	36		6	0	62		10	2
11		1	5	37		6	1	63		10	3
12		2	0	38		6	2	64		10	4
13		2	1	39		6	3	65		10	5
14		2	2	40		6	4	66-70		11	0
15		2	3	41		6	5	71-76		12	
16		2	4	42		7	0	77-82		13	
17		2	5	43		7	1	83-88		14	
18		3	0	44		7	2	89-94		15	
19		3	1	45		7	3	95-100		16	
20		3	2	46		7	4	101-106		17	
21		3	3	47		7	5	107-112		18	
22		3	4	48		8	0	113-118		19	
23		3	5	49		8	1	119-124		20	
24		4	0	50		8	2	125-130		21	
25		4	1	51		8	3	131-136		22	
26		4	2	52		8	4	137-142		23	

Feet	*to*	Fathoms	Feet_	*to*	Fathoms	Feet	*to*	Fathoms	Feet	*to*	Fathoms
143-148		24	311-316		52	479-484		80	647-652		108
149-154		25	317-322		53	485-490		81	653-658		109
155-160		26	323-328		54	491-496		82	659-664		110
161-166		27	329-334		55	497-502		83	665-670		111
167-172		28	335-340		56	503-508		84	671-676		112
173-178		29	341-346		57	509-514		85	677-682		113
179-184		30	347-352		58	515-520		86	683-688		114
185-190		31	353-358		59	521-526		87	689-694		115
191-196		32	359-364		60	527-532		88	695-700		116
197-202		33	365-370		61	533-538		89	701-706		117
203-208		34	371-376		62	539-544		90	707-712		118
209-214		35	377-382		63	545-550		91	713-718		119
215-220		36	383-388		64	551-556		92	719-724		120
221-226		37	389-394		65	557-562		93	725-730		121
227-232		38	395-400		66	563-568		94	731-736		122
233-238		39	401-406		67	569-574		95	737-742		123
239-244		40	407-412		68	575-580		96	743-748		124
245-250		41	413-418		69	581-586		97	749-754		125
251-256		42	419-424		70	587-592		98	755-760		126
257-262		43	425-430		71	593-598		99	761-766		127
263-268		44	431-436		72	599-604		100	767-772		128
269-274		45	437-442		73	605-610		101	773-778		129
275-280		46	443-448		74	611-616		102	779-784		130
281-286		47	449-454		75	617-622		103	785-790		131
287-292		48	455-460		76	623-628		104	791-796		132
293-298		49	461-466		77	629-634		105	797-802		133
299-304		50	467-472		78	635-640		106	803-808		134
305-310		51	473-478		79	641-646		107	809-814		135

Feet	*to*	Fathoms	Feet	*to*	Fathoms	Feet	*to*	Fathoms
815-820		136	983-988		164	1151-1156		192
821-826		137	989-994		165	1157-1162		193
827-832		138	995-1000		166	1163-1168		194
833-838		139	1001-1006		167	1169-1174		195
839-844		140	1007-1012		168	1175-1180		196
845-850		141	1013-1018		169	1181-1186		197
851-856		142	1019-1024		170	1187-1192		198
857-862		143	1025-1030		171	1193-1198		199
863-868		144	1031-1036		172	1199-1204		200
869-874		145	1037-1042		173	1205-1210		201
875-880		146	1043-1048		174	1211-1216		202
881-886		147	1049-1054		175	1217-1222		203
887-892		148	1055-1060		176	1223-1228		204
893-898		149	1061-1066		177	1229-1234		205
899-904		150	1067-1072		178	1235-1240		206
905-910		151	1073-1078		179	1241-1246		207
911-916		152	1079-1084		180	1247-1252		208
917-922		153	1085-1090		181	1253-1258		209
923-928		154	1091-1096		182	1259-1264		210
929-934		155	1097-1102		183	1265-1270		211
935-940		156	1103-1108		184	1271-1276		212
941-946		157	1109-1114		185	1277-1282		213
947-952		158	1115-1120		186	1283-1288		214
953-958		159	1121-1126		187	1289-1294		215
959-964		160	1127-1132		188	1295-1300		216
965-970		161	1133-1138		189	1301-1306		217
971-976		162	1139-1144		190	1307-1312		218
977-982		163	1145-1150		191	1313-1318		219

Feet	*to*	Fathoms
1319-1324		220
1325-1330		221
1331-1336		222
1337-1342		223
1343-1348		224
1349-1354		225
1355-1360		226
1361-1366		227
1367-1372		228
1373-1378		229
1379-1384		230
1385-1390		231
1391-1396		232
1397-1402		233
1403-1408		234
1409-1414		235
1415-1420		236
1421-1426		237
1427-1432		238
1433-1438		239
1439-1444		240
1445-1450		241
1451-1456		242

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JUNE 22, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: APPENDIX IV: Meters to Fathom Conversion Table

Effective immediately, the following attachment replaces pages IV-29 through IV-38 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment serves to correct several rounding errors in the Meters to Fathom Conversion Table.

The attachment is to be inserted into the Nautical Chart Manual, Volume 2, Seventh (1992) Edition, immediately after page IV-28 in APPENDIX IV: MISCELLANEOUS REFERENCES.

NAUTICAL CHART MANUAL

Meters to Fathoms Conversion Table

ONE METER INTERVALS TO 250 METERS

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
1	0.55	48	26.25	95	51.95	142	77.65
2	1.09	49	26.79	96	52.49	143	78.19
3	1.64	50	27.34	97	53.04	144	78.74
4	2.19	51	27.89	98	53.59	145	79.29
5	2.73	52	28.43	99	54.13	146	79.83
6	3.28	53	28.98	100	54.68	147	80.38
7	3.83	54	29.53	101	55.23	148	80.93
8	4.37	55	30.07	102	55.77	149	81.47
9	4.92	56	30.62	103	56.32	150	82.02
10	5.47	57	31.17	104	56.87	151	82.57
11	6.01	58	31.71	105	57.42	152	83.12
12	6.56	59	32.26	106	57.96	153	83.66
13	7.11	60	32.81	107	58.51	154	84.21
14	7.66	61	33.36	108	59.06	155	84.76
15	8.20	62	33.90	109	59.60	156	85.30
16	8.75	63	34.45	110	60.15	157	85.85
17	9.30	64	35.00	111	60.70	158	86.40
18	9.84	65	35.54	112	61.24	159	86.94
19	10.39	66	36.09	113	61.79	160	87.49
20	10.94	67	36.64	114	62.34	161	88.04
21	11.48	68	37.18	115	62.88	162	88.58
22	12.03	69	37.73	116	63.43	163	89.13
23	12.58	70	38.28	117	63.98	164	89.68
24	13.12	71	38.82	118	64.52	165	90.22
25	13.67	72	39.37	119	65.07	166	90.77
26	14.22	73	39.92	120	65.62	167	91.32
27	14.76	74	40.46	121	66.16	168	91.86
28	15.31	75	41.01	122	66.71	169	92.41
29	15.86	76	41.56	123	67.26	170	92.96
30	16.40	77	42.10	124	67.80	171	93.50
31	16.95	78	42.65	125	68.35	172	94.05
32	17.50	79	43.20	126	68.90	173	94.60
33	18.04	80	43.74	127	69.44	174	95.14
34	18.59	81	44.29	128	69.99	175	95.69
35	19.14	82	44.84	129	70.54	176	96.24
36	19.69	83	45.39	130	71.09	177	96.79
37	20.23	84	45.93	131	71.63	178	97.33
38	20.78	85	46.48	132	72.18	179	97.88
39	21.33	86	47.03	133	72.73	180	98.43
40	21.87	87	47.57	134	73.27	181	98.97
41	22.42	88	48.12	135	73.82	182	99.52
42	22.97	89	48.67	136	74.37	183	100.07
43	23.51	90	49.21	137	74.91	184	100.61
44	24.06	91	49.76	138	75.46	185	101.16
45	24.61	92	50.31	139	76.01	186	101.71
46	25.15	93	50.85	140	76.55	187	102.25
47	25.70	94	51.40	141	77.10	188	102.80

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
189	103.35	204	111.55	219	119.75	235	128.50
190	103.89	205	112.10	220	120.30	236	129.05
191	104.44	206	112.64	221	120.85	237	129.59
192	104.99	207	113.19	222	121.39	238	130.14
193	105.53	208	113.74	223	121.94	239	130.69
194	106.08	209	114.28	224	122.49	240	131.23
195	106.63	210	114.83	225	123.03	241	131.78
196	107.17	211	115.38	226	123.58	242	132.33
197	107.72	212	115.92	227	124.13	243	132.87
198	108.27	213	116.47	228	124.67	244	133.42
199	108.82	214	117.02	229	125.22	245	133.97
200	109.36	215	117.56	230	125.77	246	134.52
201	109.91	216	118.11	231	126.31	247	135.06
202	110.46	217	118.66	232	126.86	248	135.61
203	111.00	218	119.20	233	127.41	249	136.16
				234	127.95	250	136.70

FIVE METER INTERVALS - 250 METERS TO 500 METERS

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
250	136.70	325	177.71	400	218.72	475	259.73
255	139.44	330	180.45	405	221.46	480	262.47
260	142.17	335	183.18	410	224.19	485	265.20
265	144.90	340	185.92	415	226.93	490	267.94
270	147.64	345	188.65	420	229.66	495	270.67
275	150.37	350	191.38	425	232.39	500	273.41
280	153.11	355	194.12	430	235.13		
285	155.84	360	196.85	435	237.86		
290	158.57	365	199.59	440	240.60		
295	161.31	370	202.32	445	243.33		
300	164.04	375	205.05	450	246.06		
305	166.78	380	207.79	455	248.80		
310	169.51	385	210.52	460	251.53		
315	172.25	390	213.26	465	254.27		
320	174.98	395	215.99	470	257.00		

NAUTICAL CHART MANUAL

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
500	273.41	970	530.41	1440	787.41	1910	1044.41
510	278.87	980	535.87	1450	792.87	1920	1049.88
520	284.34	990	541.34	1460	798.34	1930	1055.34
530	289.81	1000	546.81	1470	803.81	1940	1060.81
540	295.28	1010	552.28	1480	809.28	1950	1066.28
550	300.75	1020	557.75	1490	814.75	1960	1071.75
560	306.21	1030	563.21	1500	820.22	1970	1077.22
570	311.68	1040	568.68	1510	825.68	1980	1082.68
580	317.15	1050	574.15	1520	831.15	1990	1088.15
590	322.62	1060	579.62	1530	836.62	2000	1093.62
600	328.09	1070	585.09	1540	842.09	2010	1099.09
610	333.55	1080	590.55	1550	847.56	2020	1104.56
620	339.02	1090	596.02	1560	853.02	2030	1110.02
630	344.49	1100	601.49	1570	858.49	2040	1115.49
640	349.96	1110	606.96	1580	863.96	2050	1120.96
650	355.43	1120	612.43	1590	869.43	2060	1126.43
660	360.89	1130	617.90	1600	874.90	2070	1131.90
670	366.36	1140	623.36	1610	880.36	2080	1137.36
680	371.83	1150	628.83	1620	885.83	2090	1142.83
690	377.30	1160	634.30	1630	891.30	2100	1148.30
700	382.77	1170	639.77	1640	896.77	2110	1153.77
710	388.24	1180	645.24	1650	902.24	2120	1159.24
720	393.70	1190	650.70	1660	907.70	2130	1164.71
730	399.17	1200	656.17	1670	913.17	2140	1170.17
740	404.64	1210	661.64	1680	918.64	2150	1175.64
750	410.11	1220	667.11	1690	924.11	2160	1181.11
760	415.58	1230	672.58	1700	929.58	2170	1186.58
770	421.04	1240	678.04	1710	935.05	2180	1192.05
780	426.51	1250	683.51	1720	940.51	2190	1197.51
790	431.98	1260	688.98	1730	945.98	2200	1202.98
800	437.45	1270	694.45	1740	951.45	2210	1208.45
810	442.92	1280	699.92	1750	956.92	2220	1213.92
820	448.38	1290	705.38	1760	962.39	2230	1219.39
830	453.85	1300	710.85	1770	967.85	2240	1224.85
840	459.32	1310	716.32	1780	973.32	2250	1230.32
850	464.79	1320	721.79	1790	978.79	2260	1235.79
860	470.26	1330	727.26	1800	984.26	2270	1241.26
870	475.72	1340	732.73	1810	989.73	2280	1246.73
880	481.19	1350	738.19	1820	995.19	2290	1252.19
890	486.66	1360	743.66	1830	1000.66	2300	1257.66
900	492.13	1370	749.13	1840	1006.13	2310	1263.13
910	497.60	1380	754.60	1850	1011.60	2320	1268.60
920	503.07	1390	760.07	1860	1017.07	2330	1274.07
930	508.53	1400	765.53	1870	1022.53	2340	1279.54
940	514.00	1410	771.00	1880	1028.00	2350	1285.00
950	519.47	1420	776.47	1890	1033.47	2360	1290.47
960	524.94	1430	781.94	1900	1038.94	2370	1295.94

TEN METER INTERVALS - 500 METERS TO 5000 METERS

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
2380	1301.41	2850	1558.41	3320	1815.41	3790	2072.41
2390	1306.88	2860	1563.88	3330	1820.88	3800	2077.88
2400	1312.34	2870	1569.34	3340	1826.35	3810	2083.35
2410	1317.81	2880	1574.81	3350	1831.81	3820	2088.81
2420	1323.28	2890	1580.28	3360	1837.28	3830	2094.28
2430	1328.75	2900	1585.75	3370	1842.75	3840	2099.75
2440	1334.22	2910	1591.22	3380	1848.22	3850	2105.22
2450	1339.68	2920	1596.69	3390	1853.69	3860	2110.69
2460	1345.15	2930	1602.15	3400	1859.15	3870	2116.15
2470	1350.62	2940	1607.62	3410	1864.62	3880	2121.62
2480	1356.09	2950	1613.09	3420	1870.09	3890	2127.09
2490	1361.56	2960	1618.56	3430	1875.56	3900	2132.56
2500	1367.03	2970	1624.03	3440	1881.03	3910	2138.03
2510	1372.49	2980	1629.49	3450	1886.49	3920	2143.50
2520	1377.96	2990	1634.96	3460	1891.96	3930	2148.96
2530	1383.43	3000	1640.43	3470	1897.43	3940	2154.43
2540	1388.90	3010	1645.90	3480	1902.90	3950	2159.90
2550	1394.37	3020	1651.37	3490	1908.37	3960	2165.37
2560	1399.83	3030	1656.83	3500	1913.84	3970	2170.84
2570	1405.30	3040	1662.30	3510	1919.30	3980	2176.30
2580	1410.77	3050	1667.77	3520	1924.77	3990	2181.77
2590	1416.24	3060	1673.24	3530	1930.24	4000	2187.24
2600	1421.71	3070	1678.71	3540	1935.71	4010	2192.71
2610	1427.17	3080	1684.17	3550	1941.18	4020	2198.18
2620	1432.64	3090	1689.64	3560	1946.64	4030	2203.64
2630	1438.11	3100	1695.11	3570	1952.11	4040	2209.11
2640	1443.58	3110	1700.58	3580	1957.58	4050	2214.58
2650	1449.05	3120	1706.05	3590	1963.05	4060	2220.05
2660	1454.51	3130	1711.52	3600	1968.52	4070	2225.52
2670	1459.98	3140	1716.98	3610	1973.98	4080	2230.98
2680	1465.45	3150	1722.45	3620	1979.45	4090	2236.45
2690	1470.92	3160	1727.92	3630	1984.92	4100	2241.92
2700	1476.39	3170	1733.39	3640	1990.39	4110	2247.39
2710	1481.86	3180	1738.86	3650	1995.86	4120	2252.86
2720	1487.32	3190	1744.32	3660	2001.32	4130	2258.33
2730	1492.79	3200	1749.79	3670	2006.79	4140	2263.79
2740	1498.26	3210	1755.26	3680	2012.26	4150	2269.26
2750	1503.73	3220	1760.73	3690	2017.73	4160	2274.73
2760	1509.20	3230	1766.20	3700	2023.20	4170	2280.20
2770	1514.66	3240	1771.66	3710	2028.67	4180	2285.67
2780	1520.13	3250	1777.13	3720	2034.13	4190	2291.13
2790	1525.60	3260	1782.60	3730	2039.60	4200	2296.60
2800	1531.07	3270	1788.07	3740	2045.07	4210	2302.07
2810	1536.54	3280	1793.54	3750	2050.54	4220	2307.54
2820	1542.00	3290	1799.00	3760	2056.01	4230	2313.01
2830	1547.47	3300	1804.47	3770	2061.47	4240	2318.47
2840	1552.94	3310	1809.94	3780	2066.94	4250	2323.94

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
4260	2329.41	4450	2433.30	4640	2537.20	4830	2641.09
4270	2334.88	4460	2438.77	4650	2542.67	4840	2646.56
4280	2340.35	4470	2444.24	4660	2548.13	4850	2652.03
4290	2345.81	4480	2449.71	4670	2553.60	4860	2657.50
4300	2351.28	4490	2455.18	4680	2559.07	4870	2662.96
4310	2356.75	4500	2460.65	4690	2564.54	4880	2668.43
4320	2362.22	4510	2466.11	4700	2570.01	4890	2673.90
4330	2367.69	4520	2471.58	4710	2575.48	4900	2679.37
4340	2373.16	4530	2477.05	4720	2580.94	4910	2684.84
4350	2378.62	4540	2482.52	4730	2586.41	4920	2690.31
4360	2384.09	4550	2487.99	4740	2591.88	4930	2695.77
4370	2389.56	4560	2493.45	4750	2597.35	4940	2701.24
4380	2395.03	4570	2498.92	4760	2602.82	4950	2706.71
4390	2400.50	4580	2504.39	4770	2608.28	4960	2712.18
4400	2405.96	4590	2509.86	4780	2613.75	4970	2717.65
4410	2411.43	4600	2515.33	4790	2619.22	4980	2723.11
4420	2416.90	4610	2520.79	4800	2624.69	4990	2728.58
4430	2422.37	4620	2526.26	4810	2630.16	5000	2734.05
4440	2427.84	4630	2531.73	4820	2635.62		

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TWENTY-FIVE METER INTERVALS - 500 METERS TO 5000 METERS

Meters	Fathoms	Meters	Fathoms	Meters	Fathoms	Meters	Fathoms
500	273.41	1625	888.57	2750	1503.73	3875	2118.89
525	287.08	1650	902.24	2775	1517.40	3900	2132.56
550	300.75	1675	915.91	2800	1531.07	3925	2146.23
575	314.42	1700	929.58	2825	1544.74	3950	2159.90
600	328.09	1725	943.25	2850	1558.41	3975	2173.57
625	341.76	1750	956.92	2875	1572.08	4000	2187.24
650	355.43	1775	970.59	2900	1585.75	4025	2200.91
675	369.10	1800	984.26	2925	1599.42	4050	2214.58
700	382.77	1825	997.93	2950	1613.09	4075	2228.25
725	396.44	1850	1011.60	2975	1626.76	4100	2241.92
750	410.11	1875	1025.27	3000	1640.43	4125	2255.59
775	423.78	1900	1038.94	3025	1654.10	4150	2269.26
800	437.45	1925	1052.61	3050	1667.77	4175	2282.93
825	451.12	1950	1066.28	3075	1681.44	4200	2296.60
850	464.79	1975	1079.95	3100	1695.11	4225	2310.27
875	478.46	2000	1093.62	3125	1708.78	4250	2323.94
900	492.13	2025	1107.29	3150	1722.45	4275	2337.61
925	505.80	2050	1120.96	3175	1736.12	4300	2351.28
950	519.47	2075	1134.63	3200	1749.79	4325	2364.95
975	533.14	2100	1148.30	3225	1763.46	4350	2378.62
1000	546.81	2125	1161.97	3250	1777.13	4375	2392.29
1025	560.48	2150	1175.64	3275	1790.80	4400	2405.96
1050	574.15	2175	1189.31	3300	1804.47	4425	2419.63
1075	587.82	2200	1202.98	3325	1818.14	4450	2433.30
1100	601.49	2225	1216.65	3350	1831.81	4475	2446.97
1125	615.16	2250	1230.32	3375	1845.48	4500	2460.65
1150	628.83	2275	1243.99	3400	1859.15	4525	2474.32
1175	642.50	2300	1257.66	3425	1872.82	4550	2487.99
1200	656.17	2325	1271.33	3450	1886.49	4575	2501.66
1225	669.84	2350	1285.00	3475	1900.16	4600	2515.33
1250	683.51	2375	1298.67	3500	1913.84	4625	2529.00
1275	697.18	2400	1312.34	3525	1927.51	4650	2542.67
1300	710.85	2425	1326.01	3550	1941.18	4675	2556.34
1325	724.52	2450	1339.68	3575	1954.85	4700	2570.01
1350	738.19	2475	1353.35	3600	1968.52	4725	2583.68
1375	751.86	2500	1367.03	3625	1982.19	4750	2597.35
1400	765.53	2525	1380.70	3650	1995.86	4775	2611.02
1425	779.20	2550	1394.37	3675	2009.53	4800	2624.69
1450	792.87	2575	1408.04	3700	2023.20	4825	2638.36
1475	806.54	2600	1421.71	3725	2036.87	4850	2652.03
1500	820.22	2625	1435.38	3750	2050.54	4875	2665.70
1525	833.89	2650	1449.05	3775	2064.21	4900	2679.37
1550	847.56	2675	1462.72	3800	2077.88	4925	2693.04
1575	861.23	2700	1476.39	3825	2091.55	4950	2706.71
1600	874.90	2725	1490.06	3850	2105.22	4975	2720.38
						5000	2734.05

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MAY 29, 2001

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual Length Conversion Tables

Effective immediately, the following attachment replaces pages IV-37 through IV-44 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

Pages IV-37 through IV-44 improve the legibility of the following Nautical Chart Manual conversion tables:

1. Length: Meters to Feet
2. Length: Feet to Meters
3. Length: Nautical Miles to Statute Miles

and are to be inserted into the Nautical Chart Manual, Volume 2, Appendix IV: Miscellaneous References, immediately after page IV-36.

Attachment

NAUTICAL CHART MANUAL

LENGTH: METERS TO FEET

[Reduction Factor: 1 meter = 3.280833333 feet]

(Part 1 of 2)

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
0		50	164.04167	100	328.08333	150	492.12500	200	656.16667	250	820.20833	300	984.25000	350	1148.29167	400	1312.33333	450	1476.37500
1	3.28083	51	167.32250	101	331.36417	151	495.40583	201	659.44750	251	823.48917	301	987.53083	351	1151.57250	401	1315.61417	451	1479.65583
2	6.56167	52	170.60333	102	334.64500	152	498.68667	202	662.72833	252	826.77000	302	990.81167	352	1154.85333	402	1318.89500	452	1482.93667
3	9.84250	53	173.88417	103	337.92583	153	501.96750	203	666.00917	253	830.05083	303	994.09250	353	1158.13417	403	1322.17583	453	1486.21750
4	13.12333	54	177.16500	104	341.20667	154	505.24833	204	669.29000	254	833.33167	304	997.37333	354	1161.41500	404	1325.45667	454	1489.49833
5	16.40417	55	180.44583	105	344.48750	155	508.52917	205	672.57083	255	836.61250	305	1000.65417	355	1164.69583	405	1328.73750	455	1492.77917
6	19.68500	56	183.72667	106	347.76833	156	511.81000	206	675.85167	256	839.89333	306	1003.93500	356	1167.97667	406	1332.01833	456	1496.06000
7	22.96583	57	187.00750	107	351.04917	157	515.09083	207	679.13250	257	843.17417	307	1007.21583	357	1171.25750	407	1335.29917	457	1499.34083
8	26.24667	58	190.28833	108	354.33000	158	518.37167	208	682.41333	258	846.45500	308	1010.49667	358	1174.53833	408	1338.58000	458	1502.62167
9	29.52750	59	193.56917	109	357.61083	159	521.65250	209	685.69417	259	849.73583	309	1013.77750	359	1177.81917	409	1341.86083	459	1505.90250
10	32.80833	60	196.85000	110	360.89167	160	524.93333	210	688.97500	260	853.01667	310	1017.05833	360	1181.10000	410	1345.14167	460	1509.18333
11	36.08917	61	200.13083	111	364.17250	161	528.21417	211	692.25583	261	856.29750	311	1020.33917	361	1184.38083	411	1348.42250	461	1512.46417
12	39.37000	62	203.41167	112	367.45333	162	531.49500	212	695.53667	262	859.57833	312	1023.62000	362	1187.66167	412	1351.70333	462	1515.74500
13	42.65083	63	206.69250	113	370.73417	163	534.77583	213	698.81750	263	862.85917	313	1026.90083	363	1190.94250	413	1354.98417	463	1519.02583
14	45.93167	64	209.97333	114	374.01500	164	538.05667	214	702.09833	264	866.14000	314	1030.18167	364	1194.22333	414	1358.26500	464	1522.30667
15	49.21250	65	213.25417	115	377.29583	165	541.33750	215	705.37917	265	869.42083	315	1033.46250	365	1197.50417	415	1361.54583	465	1525.58750
16	52.49333	66	216.53500	116	380.57667	166	544.61833	216	708.66000	266	872.70167	316	1036.74333	366	1200.78500	416	1364.82667	466	1528.86833
17	55.77417	67	219.81583	117	383.85750	167	547.89917	217	711.94083	267	875.98250	317	1040.02417	367	1204.06583	417	1368.10750	467	1532.14917
18	59.05500	68	223.09667	118	387.13833	168	551.18000	218	715.22167	268	879.26333	318	1043.30500	368	1207.34667	418	1371.38833	468	1535.43000
19	62.33583	69	226.37750	119	390.41917	169	554.46083	219	718.50250	269	882.54417	319	1046.58583	369	1210.62750	419	1374.66917	469	1538.71083
20	65.61667	70	229.65833	120	393.70000	170	557.74167	220	721.78333	270	885.82500	320	1049.86667	370	1213.90833	420	1377.95000	470	1541.99167
21	68.89750	71	232.93917	121	396.98083	171	561.02250	221	725.06417	271	889.10583	321	1053.14750	371	1217.18917	421	1381.23083	471	1545.27250
22	72.17833	72	236.22000	122	400.26167	172	564.30333	222	728.34500	272	892.38667	322	1056.42833	372	1220.47000	422	1384.51167	472	1548.55333
23	75.45917	73	239.50083	123	403.54250	173	567.58417	223	731.62583	273	895.66750	323	1059.70917	373	1223.75083	423	1387.79250	473	1551.83417
24	78.74000	74	242.78167	124	406.82333	174	570.86500	224	734.90667	274	898.94833	324	1062.99000	374	1227.03167	424	1391.07333	474	1555.11500
25	82.02083	75	246.06250	125	410.10417	175	574.14583	225	738.18750	275	902.22917	325	1066.27083	375	1230.31250	425	1394.35417	475	1558.39583
26	85.30167	76	249.34333	126	413.38500	176	577.42667	226	741.46833	276	905.51000	326	1069.55167	376	1233.59333	426	1397.63500	476	1561.67667
27	88.58250	77	252.62417	127	416.66583	177	580.70750	227	744.74917	277	908.79083	327	1072.83250	377	1236.87417	427	1400.91583	477	1564.95750
28	91.86333	78	255.90500	128	419.94667	178	583.98833	228	748.03000	278	912.07167	328	1076.11333	378	1240.15500	428	1404.19667	478	1568.23833
29	95.14417	79	259.18583	129	423.22750	179	587.26917	229	751.31083	279	915.35250	329	1079.39417	379	1243.43583	429	1407.47750	479	1571.51917
30	98.42500	80	262.46667	130	426.50833	180	590.55000	230	754.59167	280	918.63333	330	1082.67500	380	1246.71667	430	1410.75833	480	1574.80000
31	101.70583	81	265.74750	131	429.78917	181	593.83083	231	757.87250	281	921.91417	331	1085.95583	381	1249.99750	431	1414.03917	481	1578.08083
32	104.98667	82	269.02833	132	433.07000	182	597.11167	232	761.15333	282	925.19500	332	1089.23667	382	1253.27833	432	1417.32000	482	1581.36167
33	108.26750	83	272.30917	133	436.35083	183	600.39250	233	764.43417	283	928.47583	333	1092.51750	383	1256.55917	433	1420.60083	483	1584.64250
34	111.54833	84	275.59000	134	439.63167	184	603.67333	234	767.71500	284	931.75667	334	1095.79833	384	1259.84000	434	1423.88167	484	1587.92333
35	114.82917	85	278.87083	135	442.91250	185	606.95417	235	770.99583	285	935.03750	335	1099.07917	385	1263.12083	435	1427.16250	485	1591.20417
36	118.11000	86	282.15167	136	446.19333	186	610.23500	236	774.27667	286	938.31833	336	1102.36000	386	1266.40167	436	1430.44333	486	1594.48500
37	121.39083	87	285.43250	137	449.47417	187	613.51583	237	777.55750	287	941.59917	337	1105.64083	387	1269.68250	437	1433.72417	487	1597.76583
38	124.67167	88	288.71333	138	452.75500	188	616.79667	238	780.83833	288	944.88000	338	1108.92167	388	1272.96333	438	1437.00500	488	1601.04667
39	127.95250	89	291.99417	139	456.03583	189	620.07750	239	784.11917	289	948.16083	339	1112.20250	389	1276.24417	439	1440.28583	489	1604.32750
40	131.23333	90	295.27500	140	459.31667	190	623.35833	240	787.40000	290	951.44167	340	1115.48333	390	1279.52500	440	1443.56667	490	1607.60833
41	134.51417	91	298.55583	141	462.59750	191	626.63917	241	790.68083	291	954.72250	341	1118.76417	391	1282.80583	441	1446.84750	491	1610.88917
42	137.79500	92	301.83667	142	465.87833	192	629.92000	242	793.96167	292	958.00333	342	1122.04500	392	1286.08667	442	1450.12833	492	1614.17000
43	141.07583	93	305.11750	143	469.15917	193	633.20083	243	797.24250	293	961.28417	343	1125.32583	393	1289.36750	443	1453.40917	493	1617.45083
44	144.35667	94	308.39833	144	472.44000	194	636.48167	244	800.52333	294	964.56500	344	1128.60667	394	1292.64833	444	1456.69000	494	1620.73167
45	147.63750	95	311.67917	145	475.72083	195	639.76250	245	803.80417	295	967.84583	345	1131.88750	395	1295.92917	445	1459.97083	495	1624.01250
46	150.91833	96	314.96000	146	479.00167	196	643.04333	246	807.08500	296	971.12667	346	1135.16833	396	1299.21000	446	1463.25167	496	1627.29333
47	154.19917	97	318.24083	147	482.28250	197	646.32417	247	810.36583	297	974.40750	347	1138.44917	397	1302.49083	447	1466.53250	497	1630.57417
48	157.48000	98	321.52167	148	485.56333	198	649.60500	248	813.64667	298	977.68833	348	1141.73000	398	1305.77167	448	1469.81333	498	1633.85500
49	160.76083	99	324.80250	149	488.84417	199	652.88583	249	816.92750	299	980.96917	349	1145.01083	399	1309.05250	449	1473.09417	499	1637.13583

LENGTH: METERS TO FEET

[Reduction Factor: 1 meter = 3.280833333]

(Part 2 of 2)

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
500	1640.41667	550	1804.45833	600	1968.50000	650	2132.54167	700	2296.58333	750	2460.62500	800	2624.66667	850	2788.70833	900	2952.75000	950	3116.79167
501	1643.69750	551	1807.73917	601	1971.78083	651	2135.82250	701	2299.86417	751	2463.90583	801	2627.94750	851	2791.98917	901	2956.03083	951	3120.07250
502	1646.97833	552	1811.02000	602	1975.06167	652	2139.10333	702	2303.14500	752	2467.18667	802	2631.22833	852	2795.27000	902	2959.31167	952	3123.35333
503	1650.25917	553	1814.30083	603	1978.34250	653	2142.38417	703	2306.42583	753	2470.46750	803	2634.50917	853	2798.55083	903	2962.59250	953	3126.63417
504	1653.54000	554	1817.58167	604	1981.62333	654	2145.66500	704	2309.70667	754	2473.74833	804	2637.79000	854	2801.83167	904	2965.87333	954	3129.91500
505	1656.82083	555	1820.86250	605	1984.90417	655	2148.94583	705	2312.98750	755	2477.02917	805	2641.07083	855	2805.11250	905	2969.15417	955	3133.19583
506	1660.10167	556	1824.14333	606	1988.18500	656	2152.22667	706	2316.26833	756	2480.31000	806	2644.35167	856	2808.39333	906	2972.43500	956	3136.47667
507	1663.38250	557	1827.42417	607	1991.46583	657	2155.50750	707	2319.54917	757	2483.59083	807	2647.63250	857	2811.67417	907	2975.71583	957	3139.75750
508	1666.66333	558	1830.70500	608	1994.74667	658	2158.78833	708	2322.83000	758	2486.87167	808	2650.91333	858	2814.95500	908	2978.99667	958	3143.03833
509	1669.94417	559	1833.98583	609	1998.02750	659	2162.06917	709	2326.11083	759	2490.15250	809	2654.19417	859	2818.23583	909	2982.27750	959	3146.31917
510	1673.22500	560	1837.26667	610	2001.30833	660	2165.35000	710	2329.39167	760	2493.43333	810	2657.47500	860	2821.51667	910	2985.55833	960	3149.60000
511	1676.50583	561	1840.54750	611	2004.58917	661	2168.63083	711	2332.67250	761	2496.71417	811	2660.75583	861	2824.79750	911	2988.83917	961	3152.88083
512	1679.78667	562	1843.82833	612	2007.87000	662	2171.91167	712	2335.95333	762	2499.99500	812	2664.03667	862	2828.07833	912	2992.12000	962	3156.16167
513	1683.06750	563	1847.10917	613	2011.15083	663	2175.19250	713	2339.23417	763	2503.27583	813	2667.31750	863	2831.35917	913	2995.40083	963	3159.44250
514	1686.34833	564	1850.39000	614	2014.43167	664	2178.47333	714	2342.51500	764	2506.55667	814	2670.59833	864	2834.64000	914	2998.68167	964	3162.72333
515	1689.62917	565	1853.67083	615	2017.71250	665	2181.75417	715	2345.79583	765	2509.83750	815	2673.87917	865	2837.92083	915	3001.96250	965	3166.00417
516	1692.91000	566	1856.95167	616	2020.99333	666	2185.03500	716	2349.07667	766	2513.11833	816	2677.16000	866	2841.20167	916	3005.24333	966	3169.28500
517	1696.19083	567	1860.23250	617	2024.27417	667	2188.31583	717	2352.35750	767	2516.39917	817	2680.44083	867	2844.48250	917	3008.52417	967	3172.56583
518	1699.47167	568	1863.51333	618	2027.55500	668	2191.59667	718	2355.63833	768	2519.68000	818	2683.72167	868	2847.76333	918	3011.80500	968	3175.84667
519	1702.75250	569	1866.79417	619	2030.83583	669	2194.87750	719	2358.91917	769	2522.96083	819	2687.00250	869	2851.04417	919	3015.08583	969	3179.12750
520	1706.03333	570	1870.07500	620	2034.11667	670	2198.15833	720	2362.20000	770	2526.24167	820	2690.28333	870	2854.32500	920	3018.36667	970	3182.40833
521	1709.31417	571	1873.35583	621	2037.39750	671	2201.43917	721	2365.48083	771	2529.52250	821	2693.56417	871	2857.60583	921	3021.64750	971	3185.68917
522	1712.59500	572	1876.63667	622	2040.67833	672	2204.72000	722	2368.76167	772	2532.80333	822	2696.84500	872	2860.88667	922	3024.92833	972	3188.97000
523	1715.87583	573	1879.91750	623	2043.95917	673	2208.00083	723	2372.04250	773	2536.08417	823	2700.12583	873	2864.16750	923	3028.20917	973	3192.25083
524	1719.15667	574	1883.19833	624	2047.24000	674	2211.28167	724	2375.32333	774	2539.36500	824	2703.40667	874	2867.44833	924	3031.49000	974	3195.53167
525	1722.43750	575	1886.47917	625	2050.52083	675	2214.56250	725	2378.60417	775	2542.64583	825	2706.68750	875	2870.72917	925	3034.77083	975	3198.81250
526	1725.71833	576	1889.76000	626	2053.80167	676	2217.84333	726	2381.88500	776	2545.92667	826	2709.96833	876	2874.01000	926	3038.05167	976	3202.09333
527	1728.99917	577	1893.04083	627	2057.08250	677	2221.12417	727	2385.16583	777	2549.20750	827	2713.24917	877	2877.29083	927	3041.33250	977	3205.37417
528	1732.28000	578	1896.32167	628	2060.36333	678	2224.40500	728	2388.44667	778	2552.48833	828	2716.53000	878	2880.57167	928	3044.61333	978	3208.65500
529	1735.56083	579	1899.60250	629	2063.64417	679	2227.68583	729	2391.72750	779	2555.76917	829	2719.81083	879	2883.85250	929	3047.89417	979	3211.93583
530	1738.84167	580	1902.88333	630	2066.92500	680	2230.96667	730	2395.00833	780	2559.05000	830	2723.09167	880	2887.13333	930	3051.17500	980	3215.21667
531	1742.12250	581	1906.16417	631	2070.20583	681	2234.24750	731	2398.28917	781	2562.33083	831	2726.37250	881	2890.41417	931	3054.45583	981	3218.49750
532	1745.40333	582	1909.44500	632	2073.48667	682	2237.52833	732	2401.57000	782	2565.61167	832	2729.65333	882	2893.69500	932	3057.73667	982	3221.77833
533	1748.68417	583	1912.72583	633	2076.76750	683	2240.80917	733	2404.85083	783	2568.89250	833	2732.93417	883	2896.97583	933	3061.01750	983	3225.05917
534	1751.96500	584	1916.00667	634	2080.04833	684	2244.09000	734	2408.13167	784	2572.17333	834	2736.21500	884	2900.25667	934	3064.29833	984	3228.34000
535	1755.24583	585	1919.28750	635	2083.32917	685	2247.37083	735	2411.41250	785	2575.45417	835	2739.49583	885	2903.53750	935	3067.57917	985	3231.62083
536	1758.52667	586	1922.56833	636	2086.61000	686	2250.65167	736	2414.69333	786	2578.73500	836	2742.77667	886	2906.81833	936	3070.86000	986	3234.90167
537	1761.80750	587	1925.84917	637	2089.89083	687	2253.93250	737	2417.97417	787	2582.01583	837	2746.05750	887	2910.09917	937	3074.14083	987	3238.18250
538	1765.08833	588	1929.13000	638	2093.17167	688	2257.21333	738	2421.25500	788	2585.29667	838	2749.33833	888	2913.38000	938	3077.42167	988	3241.46333
539	1768.36917	589	1932.41083	639	2096.45250	689	2260.49417	739	2424.53583	789	2588.57750	839	2752.61917	889	2916.66083	939	3080.70250	989	3244.74417
540	1771.65000	590	1935.69167	640	2099.73333	690	2263.77500	740	2427.81667	790	2591.85833	840	2755.90000	890	2919.94167	940	3083.98333	990	3248.02500
541	1774.93083	591	1938.97250	641	2103.01417	691	2267.05583	741	2431.09750	791	2595.13917	841	2759.18083	891	2923.22250	941	3087.26417	991	3251.30583
542	1778.21167	592	1942.25333	642	2106.29500	692	2270.33667	742	2434.37833	792	2598.42000	842	2762.46167	892	2926.50333	942	3090.54500	992	3254.58667
543	1781.49250	593	1945.53417	643	2109.57583	693	2273.61750	743	2437.65917	793	2601.70083	843	2765.74250	893	2929.78417	943	3093.82583	993	3257.86750
544	1784.77333	594	1948.81500	644	2112.85667	694	2276.89833	744	2440.94000	794	2604.98167	844	2769.02333	894	2933.06500	944	3097.10667	994	3261.14833
545	1788.05417	595	1952.09583	645	2116.13750	695	2280.17917	745	2444.22083	795	2608.26250	845	2772.30417	895	2936.34583	945	3100.38750	995	3264.42917
546	1791.33500	596	1955.37667	646	2119.41833	696	2283.46000	746	2447.50167	796	2611.54333	846	2775.58500	896	2939.62667	946	3103.66833	996	3267.71000
547	1794.61583	597	1958.65750	647	2122.69917	697	2286.74083	747	2450.78250	797	2614.82417	847	2778.86583	897	2942.90750	947	3106.94917	997	3270.99083
548	1797.89667	598	1961.93833	648	2125.98000	698	2290.02167	748	2454.06333	798	2618.10500	848	2782.14667	898	2946.18833	948	3110.23000	998	3274.27167
549	1801.17750	599	1965.21917	649	2129.26083	699	2293.30250	749	2457.34417	799	2621.38583	849	2785.42750	899	2949.46917	949	3113.51083	999	3277.55250

1 in. = .02540 meter
2 = .05080
3 = .07620
4 = .10160
5 = .12700
6 = .15240

NAUTICAL CHART MANUAL

LENGTH: FEET TO METERS

[Reduction Factor: 1 foot = 0.3048006096 meters]

(Part 1 of 2)

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
0		50	15.24003	100	30.48006	150	45.72009	200	60.96012	250	76.20015	300	91.44018	350	106.68021	400	121.92024	450	137.16027
1	0.30480	51	15.54483	101	30.78486	151	46.02489	201	61.26492	251	76.50495	301	91.74498	351	106.98501	401	122.22504	451	137.46507
2	0.60960	52	15.84963	102	31.08966	152	46.32969	202	61.56972	252	76.80975	302	92.04978	352	107.28981	402	122.52985	452	137.76988
3	0.91440	53	16.15443	103	31.39446	153	46.63449	203	61.87452	253	77.11455	303	92.35458	353	107.59462	403	122.83465	453	138.07468
4	1.21920	54	16.45923	104	31.69926	154	46.93929	204	62.17932	254	77.41935	304	92.65939	354	107.89942	404	123.13945	454	138.37948
5	1.52400	55	16.76403	105	32.00406	155	47.24409	205	62.48412	255	77.72416	305	92.96419	355	108.20422	405	123.44425	455	138.68428
6	1.82880	56	17.06883	106	32.30886	156	47.54890	206	62.78893	256	78.02896	306	93.26899	356	108.50902	406	123.74905	456	138.98908
7	2.13360	57	17.37363	107	32.61367	157	47.85370	207	63.09373	257	78.33376	307	93.57379	357	108.81382	407	124.05385	457	139.29388
8	2.43840	58	17.67844	108	32.91847	158	48.15850	208	63.39853	258	78.63856	308	93.87859	358	109.11862	408	124.35865	458	139.59868
9	2.74321	59	17.98324	109	33.22327	159	48.46330	209	63.70333	259	78.94336	309	94.18339	359	109.42342	409	124.66345	459	139.90348
10	3.04801	60	18.28804	110	33.52807	160	48.76810	210	64.00813	260	79.24816	310	94.48819	360	109.72822	410	124.96825	460	140.20828
11	3.35281	61	18.59284	111	33.83287	161	49.07290	211	64.31293	261	79.55296	311	94.79299	361	110.03302	411	125.27305	461	140.51308
12	3.65761	62	18.89764	112	34.13767	162	49.37770	212	64.61773	262	79.85776	312	95.09779	362	110.33782	412	125.57785	462	140.81788
13	3.96241	63	19.20244	113	34.44247	163	49.68250	213	64.92253	263	80.16256	313	95.40259	363	110.64262	413	125.88265	463	141.12268
14	4.26721	64	19.50724	114	34.74727	164	49.98730	214	65.22733	264	80.46736	314	95.70739	364	110.94742	414	126.18745	464	141.42748
15	4.57201	65	19.81204	115	35.05207	165	50.29210	215	65.53213	265	80.77216	315	96.01219	365	111.25222	415	126.49225	465	141.73228
16	4.87681	66	20.11684	116	35.35687	166	50.59690	216	65.83693	266	81.07696	316	96.31699	366	111.55702	416	126.79705	466	142.03708
17	5.18161	67	20.42164	117	35.66167	167	50.90170	217	66.14173	267	81.38176	317	96.62179	367	111.86182	417	127.10185	467	142.34188
18	5.48641	68	20.72644	118	35.96647	168	51.20650	218	66.44653	268	81.68656	318	96.92659	368	112.16662	418	127.40665	468	142.64669
19	5.79121	69	21.03124	119	36.27127	169	51.51130	219	66.75133	269	81.99136	319	97.23139	369	112.47142	419	127.71146	469	142.95149
20	6.09601	70	21.33604	120	36.57607	170	51.81610	220	67.05613	270	82.29616	320	97.53620	370	112.77623	420	128.01626	470	143.25629
21	6.40081	71	21.64084	121	36.88087	171	52.12090	221	67.36093	271	82.60097	321	97.84100	371	113.08103	421	128.32106	471	143.56109
22	6.70561	72	21.94564	122	37.18567	172	52.42570	222	67.66574	272	82.90577	322	98.14580	372	113.38583	422	128.62586	472	143.86589
23	7.01041	73	22.25044	123	37.49047	173	52.73051	223	67.97054	273	83.21057	323	98.45060	373	113.69063	423	128.93066	473	144.17069
24	7.31521	74	22.55525	124	37.79528	174	53.03531	224	68.27534	274	83.51537	324	98.75540	374	113.99543	424	129.23546	474	144.47549
25	7.62002	75	22.86005	125	38.10008	175	53.34011	225	68.58014	275	83.82017	325	99.06020	375	114.30023	425	129.54026	475	144.78029
26	7.92482	76	23.16485	126	38.40488	176	53.64491	226	68.88494	276	84.12497	326	99.36500	376	114.60503	426	129.84506	476	145.08509
27	8.22962	77	23.46965	127	38.70968	177	53.94971	227	69.18974	277	84.42977	327	99.66980	377	114.90983	427	130.14986	477	145.38989
28	8.53442	78	23.77445	128	39.01448	178	54.25451	228	69.49454	278	84.73457	328	99.97460	378	115.21463	428	130.45466	478	145.69469
29	8.83922	79	24.07925	129	39.31928	179	54.55931	229	69.79934	279	85.03937	329	100.27940	379	115.51943	429	130.75946	479	145.99949
30	9.14402	80	24.38405	130	39.62408	180	54.86411	230	70.10414	280	85.34417	330	100.58420	380	115.82423	430	131.06426	480	146.30429
31	9.44882	81	24.68885	131	39.92888	181	55.16891	231	70.40894	281	85.64897	331	100.88900	381	116.12903	431	131.36906	481	146.60909
32	9.75362	82	24.99365	132	40.23368	182	55.47371	232	70.71374	282	85.95377	332	101.19380	382	116.43383	432	131.67386	482	146.91389
33	10.05842	83	25.29845	133	40.53848	183	55.77851	233	71.01854	283	86.25857	333	101.49860	383	116.73863	433	131.97866	483	147.21869
34	10.36322	84	25.60325	134	40.84328	184	56.08331	234	71.32334	284	86.56337	334	101.80340	384	117.04343	434	132.28346	484	147.52350
35	10.66802	85	25.90805	135	41.14808	185	56.38811	235	71.62814	285	86.86817	335	102.10820	385	117.34823	435	132.58827	485	147.82830
36	10.97282	86	26.21285	136	41.45288	186	56.69291	236	71.93294	286	87.17297	336	102.41300	386	117.65304	436	132.89307	486	148.13310
37	11.27762	87	26.51765	137	41.75768	187	56.99771	237	72.23774	287	87.47777	337	102.71781	387	117.95784	437	133.19787	487	148.43790
38	11.58242	88	26.82245	138	42.06248	188	57.30251	238	72.54255	288	87.78258	338	103.02261	388	118.26264	438	133.50267	488	148.74270
39	11.88722	89	27.12725	139	42.36728	189	57.60732	239	72.84735	289	88.08738	339	103.32741	389	118.56744	439	133.80747	489	149.04750
40	12.19202	90	27.43205	140	42.67209	190	57.91212	240	73.15215	290	88.39218	340	103.63221	390	118.87224	440	134.11227	490	149.35230
41	12.49682	91	27.73686	141	42.97689	191	58.21692	241	73.45695	291	88.69698	341	103.93701	391	119.17704	441	134.41707	491	149.65710
42	12.80163	92	28.04166	142	43.28169	192	58.52172	242	73.76175	292	89.00178	342	104.24181	392	119.48184	442	134.72187	492	149.96190
43	13.10643	93	28.34646	143	43.58649	193	58.82652	243	74.06655	293	89.30658	343	104.54661	393	119.78664	443	135.02667	493	150.26670
44	13.41123	94	28.65126	144	43.89129	194	59.13132	244	74.37135	294	89.61138	344	104.85141	394	120.09144	444	135.33147	494	150.57150
45	13.71603	95	28.95606	145	44.19609	195	59.43612	245	74.67615	295	89.91618	345	105.15621	395	120.39624	445	135.63627	495	150.87630
46	14.02083	96	29.26086	146	44.50089	196	59.74092	246	74.98095	296	90.22098	346	105.46101	396	120.70104	446	135.94107	496	151.18110
47	14.32563	97	29.56566	147	44.80569	197	60.04572	247	75.28575	297	90.52578	347	105.76581	397	121.00584	447	136.24587	497	151.48590
48	14.63043	98	29.87046	148	45.11049	198	60.35052	248	75.59055	298	90.83058	348	106.07061	398	121.31064	448	136.55067	498	151.79070
49	14.93523	99	30.17526	149	45.41529	199	60.65532	249	75.89535	299	91.13538	349	106.37541	399	121.61544	449	136.85547	499	152.09550

7 in = .17780 meter
8 = .20320
9 = .22860
10 = .25400
11 = .27940
12 = .30480

NAUTICAL CHART MANUAL

LENGTH: FEET TO METERS

[Reduction Factor: 1 foot = 0.3048006096]

(Part 2 of 2)

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
500	152.40030	550	167.64034	600	182.88037	650	198.12040	700	213.36043	750	228.60046	800	243.84049	850	259.08052	900	274.32055	950	289.56058
501	152.70511	551	167.94514	601	183.18517	651	198.42520	701	213.66523	751	228.90526	801	244.14529	851	259.38532	901	274.62535	951	289.86538
502	153.00991	552	168.24994	602	183.48997	652	198.73000	702	213.97003	752	229.21006	802	244.45009	852	259.69012	902	274.93015	952	290.17018
503	153.31471	553	168.55474	603	183.79477	653	199.03480	703	214.27483	753	229.51486	803	244.75489	853	259.99492	903	275.23495	953	290.47498
504	153.61951	554	168.85954	604	184.09957	654	199.33960	704	214.57963	754	229.81966	804	245.05969	854	260.29972	904	275.53975	954	290.77978
505	153.92431	555	169.16434	605	184.40437	655	199.64440	705	214.88443	755	230.12446	805	245.36449	855	260.60452	905	275.84455	955	291.08458
506	154.22911	556	169.46914	606	184.70917	656	199.94920	706	215.18923	756	230.42926	806	245.66929	856	260.90932	906	276.14935	956	291.38938
507	154.53391	557	169.77394	607	185.01397	657	200.25400	707	215.49403	757	230.73406	807	245.97409	857	261.21412	907	276.45415	957	291.69418
508	154.83871	558	170.07874	608	185.31877	658	200.55880	708	215.79883	758	231.03886	808	246.27889	858	261.51892	908	276.75895	958	291.99898
509	155.14351	559	170.38354	609	185.62357	659	200.86360	709	216.10363	759	231.34366	809	246.58369	859	261.82372	909	277.06375	959	292.30378
510	155.44831	560	170.68834	610	185.92837	660	201.16840	710	216.40843	760	231.64846	810	246.88849	860	262.12852	910	277.36855	960	292.60859
511	155.75311	561	170.99314	611	186.23317	661	201.47320	711	216.71323	761	231.95326	811	247.19329	861	262.43332	911	277.67336	961	292.91339
512	156.05791	562	171.29794	612	186.53797	662	201.77800	712	217.01803	762	232.25806	812	247.49809	862	262.73813	912	277.97816	962	293.21819
513	156.36271	563	171.60274	613	186.84277	663	202.08280	713	217.32283	763	232.56287	813	247.80290	863	263.04293	913	278.28296	963	293.52299
514	156.66751	564	171.90754	614	187.14757	664	202.38760	714	217.62764	764	232.86767	814	248.10770	864	263.34773	914	278.58776	964	293.82779
515	156.97231	565	172.21234	615	187.45237	665	202.69241	715	217.93244	765	233.17247	815	248.41250	865	263.65253	915	278.89256	965	294.13259
516	157.27711	566	172.51715	616	187.75718	666	202.99721	716	218.23724	766	233.47727	816	248.71730	866	263.95733	916	279.19736	966	294.43739
517	157.58192	567	172.82195	617	188.06198	667	203.30201	717	218.54204	767	233.78207	817	249.02210	867	264.26213	917	279.50216	967	294.74219
518	157.88672	568	173.12675	618	188.36678	668	203.60681	718	218.84684	768	234.08687	818	249.32690	868	264.56693	918	279.80696	968	295.04699
519	158.19152	569	173.43155	619	188.67158	669	203.91161	719	219.15164	769	234.39167	819	249.63170	869	264.87173	919	280.11176	969	295.35179
520	158.49632	570	173.73635	620	188.97638	670	204.21641	720	219.45644	770	234.69647	820	249.93650	870	265.17653	920	280.41656	970	295.65659
521	158.80112	571	174.04115	621	189.28118	671	204.52121	721	219.76124	771	235.00127	821	250.24130	871	265.48133	921	280.72136	971	295.96139
522	159.10592	572	174.34595	622	189.58598	672	204.82601	722	220.06604	772	235.30607	822	250.54610	872	265.78613	922	281.02616	972	296.26619
523	159.41072	573	174.65075	623	189.89078	673	205.13081	723	220.37084	773	235.61087	823	250.85090	873	266.09093	923	281.33096	973	296.57099
524	159.71552	574	174.95555	624	190.19558	674	205.43561	724	220.67564	774	235.91567	824	251.15570	874	266.39573	924	281.63576	974	296.87579
525	160.02032	575	175.26035	625	190.50038	675	205.74041	725	220.98044	775	236.22047	825	251.46050	875	266.70053	925	281.94056	975	297.18059
526	160.32512	576	175.56515	626	190.80518	676	206.04521	726	221.28524	776	236.52527	826	251.76530	876	267.00533	926	282.24536	976	297.48539
527	160.62992	577	175.86995	627	191.10998	677	206.35001	727	221.59004	777	236.83007	827	252.07010	877	267.31013	927	282.55017	977	297.79020
528	160.93472	578	176.17475	628	191.41478	678	206.65481	728	221.89484	778	237.13487	828	252.37490	878	267.61494	928	282.85497	978	298.09500
529	161.23952	579	176.47955	629	191.71958	679	206.95961	729	222.19964	779	237.43967	829	252.67971	879	267.91974	929	283.15977	979	298.39980
530	161.54432	580	176.78435	630	192.02438	680	207.26441	730	222.50445	780	237.74448	830	252.98451	880	268.22454	930	283.46457	980	298.70460
531	161.84912	581	177.08915	631	192.32918	681	207.56922	731	222.80925	781	238.04928	831	253.28931	881	268.52934	931	283.76937	981	299.00940
532	162.15392	582	177.39395	632	192.63399	682	207.87402	732	223.11405	782	238.35408	832	253.59411	882	268.83414	932	284.07417	982	299.31420
533	162.45872	583	177.69876	633	192.93879	683	208.17882	733	223.41885	783	238.65888	833	253.89891	883	269.13894	933	284.37897	983	299.61900
534	162.76353	584	178.00356	634	193.24359	684	208.48362	734	223.72365	784	238.96368	834	254.20371	884	269.44374	934	284.68377	984	299.92380
535	163.06833	585	178.30836	635	193.54839	685	208.78842	735	224.02845	785	239.26848	835	254.50851	885	269.74854	935	284.98857	985	300.22860
536	163.37313	586	178.61316	636	193.85319	686	209.09322	736	224.33325	786	239.57328	836	254.81331	886	270.05334	936	285.29337	986	300.53340
537	163.67793	587	178.91796	637	194.15799	687	209.39802	737	224.63805	787	239.87808	837	255.11811	887	270.35814	937	285.59817	987	300.83820
538	163.98273	588	179.22276	638	194.46279	688	209.70282	738	224.94285	788	240.18288	838	255.42291	888	270.66294	938	285.90297	988	301.14300
539	164.28753	589	179.52756	639	194.76759	689	210.00762	739	225.24765	789	240.48768	839	255.72771	889	270.96774	939	286.20777	989	301.44780
540	164.59233	590	179.83236	640	195.07239	690	210.31242	740	225.55245	790	240.79248	840	256.03251	890	271.27254	940	286.51257	990	301.75260
541	164.89713	591	180.13716	641	195.37719	691	210.61722	741	225.85725	791	241.09728	841	256.33731	891	271.57734	941	286.81737	991	302.05740
542	165.20193	592	180.44196	642	195.68199	692	210.92202	742	226.16205	792	241.40208	842	256.64211	892	271.88214	942	287.12217	992	302.36220
543	165.50673	593	180.74676	643	195.98679	693	211.22682	743	226.46685	793	241.70688	843	256.94691	893	272.18694	943	287.42697	993	302.66701
544	165.81153	594	181.05156	644	196.29159	694	211.53162	744	226.77165	794	242.01168	844	257.25171	894	272.49174	944	287.73178	994	302.97181
545	166.11633	595	181.35636	645	196.59639	695	211.83642	745	227.07645	795	242.31648	845	257.55652	895	272.79655	945	288.03658	995	303.27661
546	166.42113	596	181.66116	646	196.90119	696	212.14122	746	227.38125	796	242.62129	846	257.86132	896	273.10135	946	288.34138	996	303.58141
547	166.72593	597	181.96596	647	197.20599	697	212.44602	747	227.68606	797	242.92609	847	258.16612	897	273.40615	947	288.64618	997	303.88621
548	167.03073	598	182.27076	648	197.51080	698	212.75083	748	227.99086	798	243.23089	848	258.47092	898	273.71095	948	288.95098	998	304.19101
549	167.33553	599	182.57557	649	197.81560	699	213.05563	749	228.29566	799	243.53569	849	258.77572	899	274.01575	949	289.25578	999	304.49581

NAUTICAL CHART MANUAL

LENGTH: *NAUTICAL MILES TO STATUTE MILES

(Part 1 of 2)

Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles
		50	57.539	100	115.078	150	172.617	200	230.155	250	287.694	300	345.233	350	402.772	400	460.311	450	517.850
1	1.151	51	58.690	101	116.228	151	173.767	201	231.306	251	288.845	301	346.384	351	403.923	401	461.462	451	519.000
2	2.302	52	59.840	102	117.379	152	174.918	202	232.457	252	289.996	302	347.535	352	405.074	402	462.612	452	520.151
3	3.452	53	60.991	103	118.530	153	176.069	203	233.608	253	291.147	303	348.685	353	406.224	403	463.763	453	521.302
4	4.603	54	62.142	104	119.681	154	177.220	204	234.759	254	292.297	304	349.836	354	407.375	404	464.914	454	522.453
5	5.754	55	63.293	105	120.832	155	178.370	205	235.909	255	293.448	305	350.987	355	408.526	405	466.065	455	523.604
6	6.905	56	64.444	106	121.982	156	179.521	206	237.060	256	294.599	306	352.138	356	409.677	406	467.216	456	524.754
7	8.055	57	65.594	107	123.133	157	180.672	207	238.211	257	295.750	307	353.289	357	410.827	407	468.366	457	525.905
8	9.206	58	66.745	108	124.284	158	181.823	208	239.362	258	296.901	308	354.439	358	411.978	408	469.517	458	527.056
9	10.357	59	67.896	109	125.435	159	182.974	209	240.512	259	298.051	309	355.590	359	413.129	409	470.668	459	528.207
10	11.508	60	69.047	110	126.585	160	184.124	210	241.663	260	299.202	310	356.741	360	414.280	410	471.819	460	529.357
11	12.659	61	70.197	111	127.736	161	185.275	211	242.814	261	300.353	311	357.892	361	415.431	411	472.969	461	530.508
12	13.809	62	71.348	112	128.887	162	186.426	212	243.965	262	301.504	312	359.042	362	416.581	412	474.120	462	531.659
13	14.960	63	72.499	113	130.038	163	187.577	213	245.116	263	302.654	313	360.193	363	417.732	413	475.271	463	532.810
14	16.111	64	73.650	114	131.189	164	188.727	214	246.266	264	303.805	314	361.344	364	418.883	414	476.422	464	533.961
15	17.262	65	74.801	115	132.339	165	189.878	215	247.417	265	304.956	315	362.495	365	420.034	415	477.573	465	535.111
16	18.412	66	75.951	116	133.490	166	191.029	216	248.568	266	306.107	316	363.646	366	421.184	416	478.723	466	536.262
17	19.563	67	77.102	117	134.641	167	192.180	217	249.719	267	307.257	317	364.796	367	422.335	417	479.874	467	537.413
18	20.714	68	78.253	118	135.792	168	193.331	218	250.869	268	308.408	318	365.947	368	423.486	418	481.025	468	538.564
19	21.865	69	79.404	119	136.942	169	194.481	219	252.020	269	309.559	319	367.098	369	424.637	419	482.176	469	539.714
20	23.016	70	80.554	120	138.093	170	195.632	220	253.171	270	310.710	320	368.249	370	425.788	420	483.326	470	540.865
21	24.166	71	81.705	121	139.244	171	196.783	221	254.322	271	311.861	321	369.399	371	426.938	421	484.477	471	542.016
22	25.317	72	82.856	122	140.395	172	197.934	222	255.473	272	313.011	322	370.550	372	428.089	422	485.628	472	543.167
23	26.468	73	84.007	123	141.546	173	199.084	223	256.623	273	314.162	323	371.701	373	429.240	423	486.779	473	544.318
24	27.619	74	85.158	124	142.696	174	200.235	224	257.774	274	315.313	324	372.852	374	430.391	424	487.930	474	545.468
25	28.769	75	86.308	125	143.847	175	201.386	225	258.925	275	316.464	325	374.003	375	431.541	425	489.080	475	546.619
26	29.920	76	87.459	126	144.998	176	202.537	226	260.076	276	317.614	326	375.153	376	432.692	426	490.231	476	547.770
27	31.071	77	88.610	127	146.149	177	203.688	227	261.226	277	318.765	327	376.304	377	433.843	427	491.382	477	548.921
28	32.222	78	89.761	128	147.299	178	204.838	228	262.377	278	319.916	328	377.455	378	434.994	428	492.533	478	550.071
29	33.373	79	90.911	129	148.450	179	205.989	229	263.528	279	321.067	329	378.606	379	436.145	429	493.683	479	551.222
30	34.523	80	92.062	130	149.601	180	207.140	230	264.679	280	322.218	330	379.756	380	437.295	430	494.834	480	552.373
31	35.674	81	93.213	131	150.752	181	208.291	231	265.830	281	323.368	331	380.907	381	438.446	431	495.985	481	553.524
32	36.825	82	94.364	132	151.903	182	209.441	232	266.980	282	324.519	332	382.058	382	439.597	432	497.136	482	554.675
33	37.976	83	95.515	133	153.053	183	210.592	233	268.131	283	325.670	333	383.209	383	440.748	433	498.287	483	555.825
34	39.126	84	96.665	134	154.204	184	211.743	234	269.282	284	326.821	334	384.360	384	441.898	434	499.437	484	556.976
35	40.277	85	97.816	135	155.355	185	212.894	235	270.433	285	327.971	335	385.510	385	443.049	435	500.588	485	558.127
36	41.428	86	98.967	136	156.506	186	214.045	236	271.583	286	329.122	336	386.661	386	444.200	436	501.739	486	559.278
37	42.579	87	100.118	137	157.656	187	215.195	237	272.734	287	330.273	337	387.812	387	445.351	437	502.890	487	560.428
38	43.730	88	101.268	138	158.807	188	216.346	238	273.885	288	331.424	338	388.963	388	446.502	438	504.040	488	561.579
39	44.880	89	102.419	139	159.958	189	217.497	239	275.036	289	332.575	339	390.113	389	447.652	439	505.191	489	562.730
40	46.031	90	103.570	140	161.109	190	218.648	240	276.187	290	333.725	340	391.264	390	448.803	440	506.342	490	563.881
41	47.182	91	104.721	141	162.260	191	219.798	241	277.337	291	334.876	341	392.415	391	449.954	441	507.493	491	565.032
42	48.333	92	105.871	142	163.410	192	220.949	242	278.488	292	336.027	342	393.566	392	451.105	442	508.643	492	566.182
43	49.483	93	107.022	143	164.561	193	222.100	243	279.639	293	337.178	343	394.717	393	452.255	443	509.794	493	567.333
44	50.634	94	108.173	144	165.712	194	223.251	244	280.790	294	338.328	344	395.867	394	453.406	444	510.945	494	568.484
45	51.785	95	109.324	145	166.863	195	224.402	245	281.940	295	339.479	345	397.018	395	454.557	445	512.096	495	569.635
46	52.936	96	110.475	146	168.013	196	225.552	246	283.091	296	340.630	346	398.169	396	455.708	446	513.247	496	570.785
47	54.087	97	111.625	147	169.164	197	226.703	247	284.242	297	341.781	347	399.320	397	456.859	447	514.397	497	571.936
48	55.237	98	112.776	148	170.315	198	227.854	248	285.393	298	342.932	348	400.470	398	458.009	448	515.548	498	573.087
49	56.388	99	113.927	149	171.466	199	229.005	249	286.544	299	344.082	349	401.621	399	459.160	449	516.699	499	574.238

*** International Nautical Mile -- 1852 meters** **Ratio: 1 to 1.150777146** **1955**

LENGTH: *NAUTICAL MILES TO STATUTE MILES

(Part 2 of 2)

Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles	Statute Miles
500	575.389	550	632.927	600	690.466	650	748.005	700	805.544	750	863.083	800	920.622	850	978.161	900	1035.699	950	1093.238
501	576.539	551	634.078	601	691.617	651	749.156	701	806.695	751	864.234	801	921.772	851	979.311	901	1036.850	951	1094.389
502	577.690	552	635.229	602	692.768	652	750.307	702	807.846	752	865.384	802	922.923	852	980.462	902	1038.001	952	1095.540
503	578.841	553	636.380	603	693.919	653	751.457	703	808.996	753	866.535	803	924.074	853	981.613	903	1039.152	953	1096.691
504	579.992	554	637.531	604	695.069	654	752.608	704	810.147	754	867.686	804	925.225	854	982.764	904	1040.303	954	1097.841
505	581.142	555	638.681	605	696.220	655	753.759	705	811.298	755	868.837	805	926.376	855	983.914	905	1041.453	955	1098.992
506	582.293	556	639.832	606	697.371	656	754.910	706	812.449	756	869.988	806	927.526	856	985.065	906	1042.604	956	1100.143
507	583.444	557	640.983	607	698.522	657	756.061	707	813.599	757	871.138	807	928.677	857	986.216	907	1043.755	957	1101.294
508	584.595	558	642.134	608	699.673	658	757.211	708	814.750	758	872.289	808	929.828	858	987.367	908	1044.906	958	1102.445
509	585.746	559	643.284	609	700.823	659	758.362	709	815.901	759	873.440	809	930.979	859	988.518	909	1046.056	959	1103.595
510	586.896	560	644.435	610	701.974	660	759.513	710	817.052	760	874.591	810	932.129	860	989.668	910	1047.207	960	1104.746
511	588.047	561	645.586	611	703.125	661	760.664	711	818.203	761	875.741	811	933.280	861	990.819	911	1048.358	961	1105.897
512	589.198	562	646.737	612	704.276	662	761.814	712	819.353	762	876.892	812	934.431	862	991.970	912	1049.509	962	1107.048
513	590.349	563	647.888	613	705.426	663	762.965	713	820.504	763	878.043	813	935.582	863	993.121	913	1050.660	963	1108.198
514	591.499	564	649.038	614	706.577	664	764.116	714	821.655	764	879.194	814	936.733	864	994.271	914	1051.810	964	1109.349
515	592.650	565	650.189	615	707.728	665	765.267	715	822.806	765	880.345	815	937.883	865	995.422	915	1052.961	965	1110.500
516	593.801	566	651.340	616	708.879	666	766.418	716	823.956	766	881.495	816	939.034	866	996.573	916	1054.112	966	1111.651
517	594.952	567	652.491	617	710.029	667	767.568	717	825.107	767	882.646	817	940.185	867	997.724	917	1055.263	967	1112.802
518	596.103	568	653.641	618	711.180	668	768.719	718	826.258	768	883.797	818	941.336	868	998.875	918	1056.413	968	1113.952
519	597.253	569	654.792	619	712.331	669	769.870	719	827.409	769	884.948	819	942.486	869	1000.025	919	1057.564	969	1115.103
520	598.404	570	655.943	620	713.482	670	771.021	720	828.560	770	886.098	820	943.637	870	1001.176	920	1058.715	970	1116.254
521	599.555	571	657.094	621	714.633	671	772.171	721	829.710	771	887.249	821	944.788	871	1002.327	921	1059.866	971	1117.405
522	600.706	572	658.245	622	715.783	672	773.322	722	830.861	772	888.400	822	945.939	872	1003.478	922	1061.017	972	1118.555
523	601.856	573	659.395	623	716.934	673	774.473	723	832.012	773	889.551	823	947.090	873	1004.628	923	1062.167	973	1119.706
524	603.007	574	660.546	624	718.085	674	775.624	724	833.163	774	890.702	824	948.240	874	1005.779	924	1063.318	974	1120.857
525	604.158	575	661.697	625	719.236	675	776.775	725	834.313	775	891.852	825	949.391	875	1006.930	925	1064.469	975	1122.008
526	605.309	576	662.848	626	720.386	676	777.925	726	835.464	776	893.003	826	950.542	876	1008.081	926	1065.620	976	1123.158
527	606.460	577	663.998	627	721.537	677	779.076	727	836.615	777	894.154	827	951.693	877	1009.232	927	1066.770	977	1124.309
528	607.610	578	665.149	628	722.688	678	780.227	728	837.766	778	895.305	828	952.843	878	1010.382	928	1067.921	978	1125.460
529	608.761	579	666.300	629	723.839	679	781.378	729	838.917	779	896.455	829	953.994	879	1011.533	929	1069.072	979	1126.611
530	609.912	580	667.451	630	724.990	680	782.528	730	840.067	780	897.606	830	955.145	880	1012.684	930	1070.223	980	1127.762
531	611.063	581	668.602	631	726.140	681	783.679	731	841.218	781	898.757	831	956.296	881	1013.835	931	1071.374	981	1128.912
532	612.213	582	669.752	632	727.291	682	784.830	732	842.369	782	899.908	832	957.447	882	1014.985	932	1072.524	982	1130.063
533	613.364	583	670.903	633	728.442	683	785.981	733	843.520	783	901.059	833	958.597	883	1016.136	933	1073.675	983	1131.214
534	614.515	584	672.054	634	729.593	684	787.132	734	844.670	784	902.209	834	959.748	884	1017.287	934	1074.826	984	1132.365
535	615.666	585	673.205	635	730.743	685	788.282	735	845.821	785	903.360	835	960.899	885	1018.438	935	1075.977	985	1133.515
536	616.817	586	674.355	636	731.894	686	789.433	736	846.972	786	904.511	836	962.050	886	1019.589	936	1077.127	986	1134.666
537	617.967	587	675.506	637	733.045	687	790.584	737	848.123	787	905.662	837	963.200	887	1020.739	937	1078.278	987	1135.817
538	619.118	588	676.657	638	734.196	688	791.735	738	849.274	788	906.812	838	964.351	888	1021.890	938	1079.429	988	1136.968
539	620.269	589	677.808	639	735.347	689	792.885	739	850.424	789	907.963	839	965.502	889	1023.041	939	1080.580	989	1138.119
540	621.420	590	678.959	640	736.497	690	794.036	740	851.575	790	909.114	840	966.653	890	1024.192	940	1081.731	990	1139.269
541	622.570	591	680.109	641	737.648	691	795.187	741	852.726	791	910.265	841	967.804	891	1025.342	941	1082.881	991	1140.420
542	623.721	592	681.260	642	738.799	692	796.338	742	853.877	792	911.415	842	968.954	892	1026.493	942	1084.032	992	1141.571
543	624.872	593	682.411	643	739.950	693	797.489	743	855.027	793	912.566	843	970.105	893	1027.644	943	1085.183	993	1142.722
544	626.023	594	683.562	644	741.100	694	798.639	744	856.178	794	913.717	844	971.256	894	1028.795	944	1086.334	994	1143.872
545	627.174	595	684.712	645	742.251	695	799.790	745	857.329	795	914.868	845	972.407	895	1029.946	945	1087.484	995	1145.023
546	628.324	596	685.863	646	743.402	696	800.941	746	858.480	796	916.019	846	973.557	896	1031.096	946	1088.635	996	1146.174
547	629.475	597	687.014	647	744.553	697	802.092	747	859.631	797	917.169	847	974.708	897	1032.247	947	1089.786	997	1147.325
548	630.626	598	688.165	648	745.704	698	803.242	748	860.781	798	918.320	848	975.859	898	1033.398	948	1090.937	998	1148.476
549	631.777	599	689.316	649	746.854	699	804.393	749	861.932	799	919.471	849	977.010	899	1034.549	949	1092.088	999	1149.626

*** International Nautical Mile -- 1852 meters** **Ratio: 1 to 1.150777146** **1955**

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 012/01 MAY 15, 2001

File With Nautical Chart Manual Volume 2, APPENDIX IV, MISCELLANEOUS REFERENCES

TO: All Cartographers
Marine Chart Division

SUBJECT: Type Specifications

APPLICATION: All Nautical Charts

Effective immediately, the following attachment replaces pages IV-45 through IV-66 and adds pages IV-67 through IV-106 in the Nautical Chart Manual, Volume 2, Seventh (1992) Edition.

The attachment updates the feature and area label type specifications document as follows:

1. The type specifications for the feature IMO Approved No Anchoring Area have been added.

2. The type specifications for the feature Particularly Sensitive Sea Area have been added.

3. The type specifications for the feature Sediment Trap have been added.

4. The survey month "May" has been deleted from the disposal area label example. The month of the survey shall not be indicated within a disposal area. (See e-mail memo from QAPSB dated March 29, 2001.)

5. The reference note for the feature Nautical Mile Line, Twelve has been revised (in the example column) from "*(see note A)*" to "*(see note X)*".

6. All references indicated as "CFR#" have been revised to "CFR section number".

7. All label examples are now provided in the point size required for the respective feature.

8. All examples of EPA Dump Site and USACE Dumping Ground labels have been revised to reflect the correct labeling format.

9. General grammatical corrections have been made where appropriate.

Pages IV-45 through IV-106 are to be inserted into the Nautical Chart Manual, Volume 2, Appendix IV: Miscellaneous References immediately after page IV-44.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

NAUTICAL CHART MANUAL

Nautical Chart Feature and Area Labels
Type Specifications

Feature labels may be shown in smaller sizes where there is limited space. Area labels may be shown in larger sizes appropriate to the chart scale and the size of the area portrayed. See Labeling Features 7.4.

A

Feature	Examples	Point Size	Type Style	Color	Remarks
Abandoned Pipeline Area or Cable area	*Abandoned Pipeline Area* *Abandoned Cable Area*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Cable & Pipeline Areas 4.14.3*
Accurate Landmark	STACK (STROBE, R LTS)	6	Swiss Regular Vertical	Black	Upper Case; See Landmarks 6 through 6.1.5
Airport	Airport	7	Swiss Light Vertical	Black	Upper & Lower Case; See Land Boundary Limits 3.7 & Buildings & Structures 3.8
Ammunition Dumping Areas (Navy)	*Dumping Ground* *Ammunition*	*7*	*Swiss Light Italic*	*Magenta*	*See Dumping Areas 4.14.5*
Anchorage Areas (Federally regulated)	*SPECIAL ANCHORAGE AREA NO. 12* *110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Anchorage Areas (Non-federally regulated)	*Anchorage Area*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Anchorage Areas 4.14.4*
Anchorage, Fairway	*FAIRWAY ANCHORAGE* *166.200 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Safety Fairways 5.9.1; must reference CFR section number*
Anchorage, Sea Plane	*SEA PLANE ANCHORAGE* *110.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Anchorage Areas 4.14.4*
Anchoring Berth Numbers	Circled Number in Green, Black, or Screened Black	7	Swiss Regular Vertical	Green, Black, or Screened Black	See Anchoring Areas 4.14.4
Approximate, Landmark	Tower (Aband Lt Ho)	6	Swiss Light Vertical	Black	Upper & Lower Case; See Landmarks 6 through 6.1.5
Aquaculture Area	*Aquaculture Area*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*
Areas, See specific area: Danger, Pipeline, etc.					
Articulated Daybeacon Characteristics	*Art R "12"* *Art G "7"*	*7*	*Swiss Regular Italic*	*Black*	*Upper & Lower Case; See Daybeacons 5.5*

Feature	Examples	Point Size	Type Style	Color	Remarks
Artificial Islands	Artificial island (MUKLUK) R Lt (Priv)	6	Swiss Light Vertical	Black	Upper & Lower Case; See Mineral Development Structures 4.13.5
At Mean Lower Low Water (in title block)	AT MEAN LOWER LOW WATER	8	Swiss Light Vertical	Black	Upper Case; See Vol 2, Appendix IV, pages 3-4
Awash, Rock: Proper Name	*Dennis Rk*	*6-12*	*Swiss Regular Italic*	*Black*	*See Geographic Names 7.4, See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2*

B

Feature	Examples	Point Size	Type Style	Color	Remarks
Bare Rock, Proper Name	Lighthouse Rock	6-12	Swiss Regular Vertical	Black	See Geographic Names 7.4, See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2
Bare Rocks, Elevations	*(3)*	*6*	*Swiss Light Italic*	*Black*	*In parenthesis; Heights & Depths of Rocks 4.9.2*
Bare	*Rep bare (2000)*	*6*	*Swiss Light Italic*	*Black*	*See Geographic Names 7.4, See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2*
Basketed Soundings, Cleared Depths	Soundings with baskets under them followed by*: Rk, Shoal, Wreck, Obstn, or h*	7	Swiss Light Vertical Soundings *with Italic labels*	Black	See Charting Cleared Depths 4.15.6
Basketed Soundings, Wire Drag Swept Depths	*Soundings with baskets under them*	*10*	*Swiss Light Italic*	*Green*	*See NOS Surveys 4.2.1, Wire Drags & Wire Sweeps 4.15 through 4.15.6*
Bay, Proper Name of	*San Francisco Bay, SAN JUAN BAY*	*5-36*	*Swiss Regular Italic*	*Black*	*See Geographic Names 7.4*
Bearings & Range Names	*Lights in line 090˚*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Ranges 5.7; Chart only if shown in the Light List*
Berth Numbers, Anchoring	Circled Number in Green, Black, or Screened Black	7	Swiss Regular Vertical	Green, Black, or Screened Black	See Anchoring Areas 4.14.4
Bollard (mooring post on wharf)	Bollard	6	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix 1
Boom, Log	*Log boom*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Logging Structures 4.13.4*
Borrow Area	*Borrow Area*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*
Bottom Characteristics	*Blds, Cy, rky, bk*	*7*	*Swiss Light Italic*	*Black*	*See Bottom Characteristics 4.7; Colors no longer charted*
Boulders	*Boulders, Blds*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Designated Abbreviations 4.7.1*
Boundary Labels, International (Water)	*UNITED STATES*	*8*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Land Boundaries & Limits 3.7*
Boundary Labels, International (Land)	UNITED STATES	8	Swiss Light Vertical	Black	Shown on Land Areas only; See Land Boundaries & Limits 3.7
Boundary Labels, State	MICHIGAN	8	Swiss Light Vertical	Black	Shown on Land Areas only; See Land Boundaries & Limits 3.7

Feature	Examples	Point Size	Type Style	Color	Remarks
Breakers	*Breakers, Bks*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Foreshore 3.3.2 & Miscellaneous Marine Limits 4.14.2*
Breakwater, above SPOR	Breakwater, Bkw	6	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion-Control Structures 3.5.2
Breakwater, Floating or Submerged	*Breakwater, Bkw*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Erosion-Control Structures 3.5.2*
Bridge Clearances	FIXED BRIDGE HOR CL 80 FT VERT CL 25 FT	5	Swiss Light Vertical	Black	Upper Case; See Bridge & Overhead Cables 3.11.1, Use bridge name if available
Bridge, Under Construction	Bridge under construction	6	Swiss Light Vertical	Black	See Bridges 3.11.1
Building Names	Post Office, Conference Center	6	Swiss Light Vertical	Black	Upper & Lower Case; See Buildings & Structures 3.8
Buoy Characteristics	*R "22"* *Fl R 4s*	*7*	*Swiss Regular Italic*	*Black*	*See Buoy Characteristics 5.3.2*

C

Feature	Examples	Point Size	Type Style	Color	Remarks
Cable Area	*Cable Area*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Cable & Pipeline Areas 4.14.3*
Cable Area, Abandoned	*Abandoned Cable Area*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Cable & Pipeline Areas 4.14.3*
Cable, Overhead - Clearances	OVHD PWR CAB AUTH CL 56 FT	5	Swiss Light Vertical	Black	Upper Case; See Overhead Cables & Crossings 3.11.2;
Cable Ferry	Cable Ferry (see note)	7	Swiss Light Vertical	Black	20% Magenta screened band centered on cable; Upper & Lower Case; See Cable Ferry 5.9.3.2
Canal	*Canal*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Manmade Features 3.6*
Catalog Number & Panel Number	Nautical Chart Catalog No. 1, PANEL B	6	Swiss Light Vertical	Black	Top Right Corner of Chart, See Vol 2, Appendix IV, pages 7, 9-11
Causeway	Causeway, Cswy	6	Swiss Light Vertical	Black	Upper & Lower Case; See Chart No. 1 (F3)
Channel Legends	*25 FT DEC 2000, 15 feet rep 2000*	*7*	*Swiss Light Italic*	*Black*	*Upper Case or Upper & Lower Case, See Tabulations, Legends & Notes 4.6.1*
Cemeteries (not landmarks)	Cemetery, Cem	6	Swiss Light Vertical	Black	Upper & Lower Case; See Buildings & Structures 3.8
Chart Cover (Small Craft Regular or Pocketfold)	**CHARLOTTE HARBOR TO TAMPA BAY**	**36**	**Swiss Bold**	**Black**	**See Vol 2, Appendix IV, page 6**

Feature	Examples	Point Size	Type Style	Color	Remarks
Chart Numbers (Conventional Charts)	14903	30	Swiss Regular Vertical	Black	Margin; See Vol 2, Appendix IV, pages 7-8
Chart Numbers (Small Craft)	**18423**	12	Swiss Regular Vertical	Black	See Vol 2, Appendix IV, pages 9-11
Chart Numbers on Index Diagram (not chart outlines)	14500, 19320, 3050	7	Swiss Light Vertical	Black, Blue, or Gold	Black for NOS charts, Blue for NIMA or Gold for international; See Chart Outlines & Diagrams 2.11
Chart Outline label	14500, 19320, 3050	12	Swiss Light Vertical	Black, Blue, or Gold	Black for NOS charts, Blue for NIMA, or Gold for international; See Chart Outlines & Diagrams 2.11
Chart Scale by Subtitle (Margin not title block)	SCALE 1:10,000	8	Swiss Light Vertical	Black	Upper Case, See Vol 2, Appendix IV, page 8
Chemical Dumping Areas (Navy)	*Dumping Ground Chemical*	*7*	*Swiss Light Italic*	*Magenta*	*See Dumping Areas 4.14.5*
Churches (not landmarks)	Church	6	Swiss Light Vertical	Black	Upper & Lower Case; See Buildings & Structures 3.8
Civil Reservations (parks, reservations, marine sanctuaries, preserves, historical areas, protected areas, critical habitats, etc.)	*CHANNEL ISLANDS NATIONAL MARINE SANCTUARY (protected area: 15 CFR 922; see note A)*	*10*	*Swiss Light Vertical or Italic*	*Blue*	*Italic if mostly water area; CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7*

Feature	Examples	Point Size	Type Style	Color	Remarks
Clay	*Clay, Cl*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Designated Abbreviations 4.7.1 & Foreshore 3.3.2*
Clearances, see Bridge, cable, lock, etc.					
Cleared Depths	Soundings with baskets under them followed by: *Rk, Shoal, Wreck, Obstn, or h*	7	Swiss Light Vertical Soundings *with Italic labels*	Black	See Charting Cleared Depths 4.15.6
Closing Line	*TERRITORIAL SEA (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Maritime Boundaries 4.14.7*
Coast Guard Station, US	CG, PT REYES COAST GUARD	7	Swiss Light Vertical	Black	Upper Case, See Miscellaneous Stations 3.9; Use name of station for Coastal & larger scale charts
COLREGS Demarcation Line	*COLREGS DEMARCATION LINE 80.325a (see note A)*	*6*	*Swiss Light Italic*	*Magenta*	*Upper Case, CFR section number & reference to note A required; See COLREGS Demarcation Line 4.14.6*
Commercial Anchorage Areas (Federally regulated)	*COMMERCIAL ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Construction, Bridge	Bridge under construction	6	Swiss Light Vertical	Black	See Bridges 3.11.1
Contiguous Zone - See 12 mile line	*TERRITORIAL SEA & CONTIGUOUS ZONE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Maritime Boundaries 4.14.7*
CONTINUED ON	CONTINUED ON CHART 14862	7	Swiss Light Vertical	Black	Upper Case, no parenthesis; See Vol 2, Appendix IV, pages 7-11
Contour, Depth (Label)	*18,18,18*	*6*	*Swiss Light Italic*	*Black, Screened Black, or Blue*	*Screened black on Modernized Charts; See Labeling of Contours/Curves 4.4.4*
Contours & Elevations on Land	*100, 200, 1251*	*6*	*Swiss Light Italic*	*Black*	*Change from Vertical type on old charts; See Land Contours 3.4.1*

Feature	Examples	Point Size	Type Style	Color	Remarks
Coral	*Coral, Co*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Foreshore 3.3.2*
Coral or Rock that uncovers, Elevation of	(3)	6	Swiss Light Vertical	Black	Underline, parenthesis; See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2
Corner, Neatline GP label	45°35'12"N 123°24'57"W	5	Swiss Light Vertical	Black	See Vol 2, Appendix IV, page 8
Course Line, Mileage label	*St M 125*	*7*	*Swiss Regular Italic*	*Magenta*	*Usually at 1 & 5 mile intervals; Upper & Lower Case; See Courses 5.8*
Courses (not Trial Courses)	*68° TRUE 65M*	*7*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Courses 5.8*
Courses, Trial	*TRIAL COURSE 6065 COURSE 18°49' - 198°49' TRUE*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Trial Courses (Q 122) 5.8.2*
Cove, Proper Water Names	*Kaalaea Cove, MAUNALUA COVE*	*5-36*	*Swiss Regular Italic*	*Black*	*See Geographic Names 7.4*
Crab Pens	*Crab pen*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Fishing Structures 4.13.2*
Creek, Proper Water Name	*Fishing Creek*	*5-36*	*Swiss Regular Italic*	*Black*	*See Geographic Names 7.4*
Crib, above SPOR/waterline	Crib	6	Swiss Light Vertical	Black	Upper & Lower Case; See Platforms & Cribs 4.13.1
Crib, Submerged	*Subm crib*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Platforms & Cribs 4.13.1*
Crib, Uncovers	*Crib*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Platforms & Cribs 4.13.1*

Feature	Examples	Point Size	Type Style	Color	Remarks
Critical Habitats	*NORTHERN RIGHT WHALE CRITICAL HABITAT (precautionary area: 50 CFR 226.13b; see note A)*	10	Swiss Light Vertical or *Italic*	Blue	*Italic if mostly water area;* CFR section number, reference to Note A & type of area added when applicable*;* See Maritime Boundaries 4.14.7
Current Direction Label	*2 kn*	*6*	*Swiss Light Italic*	*Black*	*Lower Case; See Currents 7.2*
Curves, Depth (Label)	*18,18,18*	*6*	*Swiss Light Italic*	*Black, Screened Black, or Blue*	*Screened black on Modernized Charts; See Labeling of Contours/Curves 4.4.4*

D

Feature	Examples	Point Size	Type Style	Color	Remarks
Danger Area, Regulated	*DANGER AREA 334.1370 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Dark Sector	*LT OBSC*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Types of Lights 5.2.3; Not shown over land*
Date, (Edition Number, Month & Day)	13th Ed., Dec. 4/	8	Swiss Light Vertical	Black	Bottom left corner of chart; Current edition, Upper & Lower Case; See New Edition 1.4.5
Date, (Edition Year)	01	12	Swiss Light Vertical	Black	Current edition; bottom left corner of chart; only last 2 digits shown; See New Edition 1.4.5
Datum, Horizontal (title block)	North American Datum of 1983	10	Swiss Light Vertical	Black	Upper & Lower Case, See Vol 2, Appendix IV, pages 3-4
Daybeacon Characteristics (Articulated)	*Art R "12" Art G "7"*	*7*	*Swiss Regular Italic*	*Black*	*Upper & Lower Case; See Daybeacons 5.5*
Daybeacon Characteristics (not Articulated)	GR G Bn "3" PA	7	Swiss Regular Vertical	Black	Upper & Lower Case; See Daybeacons 5.5
Dead Ship Anchorage Areas (Federally regulated)	*DEAD SHIP ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Deadhead	*Snag*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Natural Dangers 4.11.4*
Deep Draft Anchorage Areas (Federally regulated)	*DEEP DRAFT ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Defense Area	*DEFENSE AREA 334.568 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Federally Regulated Areas 4.14.1*
Degaussing Range	*DEGAUSSING RANGE*	*7*	*Swiss Light Italic*	*Black*	*Upper Case; See Miscellaneous Marine Limits 4.14.2*
Degrees (Projection Numbers)	120˚	12	Swiss Regular Vertical	Black	See Border Scales 2.10.1
Demarcation Line, COLREGS	*COLREGS DEMARCATION LINE 80.325a (see note A)*	*6*	*Swiss Light Italic*	*Magenta*	*CFR section number & reference to note A required; See COLREGS Demarcation Lines 4.14.6*
Depth Curve Label	*18,18,18*	*6*	*Swiss Light Italic*	*Black, Screened Black, or Blue*	*Screened black on Modernized Charts; See Labeling of Contours/Curves 4.4.4*

Feature	Examples	Point Size	Type Style	Color	Remarks
Depths, Cleared	Soundings with baskets under them followed by: *Rk, Shoal, Wreck, Obstn, or h*	7	Swiss Light Vertical Soundings *with Italic labels*	Black	See Charting Cleared Depths 4.15.6
Diagram, Index: Chart Numbers	14500, 19320, 3050	7	Swiss Light Vertical	Black, Blue, or Gold	Black for NOS charts, Blue for NIMA, or Gold for international; See Chart Outlines & Diagrams 2.11
Diffuser	*Diffuser*	*5*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Platforms & Cribs 4.13.1 & Chart No. 1 (L43)*
Dike	Dike	5	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion-Control Structures 3.5.2
Direction of Current, Label	*2 kn*	*6*	*Swiss Light Italic*	*Black*	*Lower Case; See Currents 7.2*
Discolored Water	*Discol water*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*
Discontinued Dump Site (EPA Established)	*Dump Site (dredged material) (discontinued) (see note S) Depths from survey of 2000*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; Delete reference to note A; See Dumping Areas 4.14.5*
Discontinued Spoil Area, Disposal Area, or Dumping Ground (USACE)	*Spoil Area, (discontinued)* *Disposal Area (discontinued)* *Dumping Ground (discontinued)*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*
Disposal Area (USACE)	*Disposal Area Depths from survey of 2000*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*
Disused Disposal Areas (Navy Established)	*Disposal Area (disused)*	*7*	*Swiss Light Italic*	*Magenta*	*Delete reference to note A; See Dumping Areas 4.14.5*
Disused Dumping Ground (Navy Established)	*Dumping Ground (disused)*	*7*	*Swiss Light Italic*	*Magenta*	*Delete reference to note A; See Dumping Areas 4.14.5*
Ditch	*Ditch*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Manmade Features 3.6*
Diving Area, Scuba	*Scuba Diving Area*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Misc. Marine Limits 4.14.2*
Dolphin, above SPOR	Dol, Dols, Dolphins	6	Swiss Light Vertical	Black	Upper & Lower Case; See Mooring Structures 4.13.7
Dolphins, submerged or uncovers	*Subm dol, Subm dols, Subm dolphins*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Mooring Structures 4.13.7*
Dry dock (floating)	*Floating Dry dock, Dry dock*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Docks & Tidal Basins 3.5.3*

Feature	Examples	Point Size	Type Style	Color	Remarks
Duck Blind	Duck blind	6	Swiss Light Vertical	Black	Upper & Lower Case; See Recreational Structures 4.13.10
Dumping Ground (Navy)	*Dumping Ground Chemical*	*7*	*Swiss Light Italic*	*Magenta*	*Label type of Dumping as Chemical, Ammunition, or Explosive; See Dumping Areas 4.14.5*
Dumping Ground (USACE)	*Dumping Ground*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*
Dump Site (EPA)	*Dump Site (dredged material) (see note S) Depths from survey of 2000*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*

E

Feature	Examples	Point Size	Type Style	Color	Remarks
Eddies	*Eddies*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Currents 7.2*
Edition Date, First	Formerly C&GS 1270, 1st Ed., Mar 1921	6	Swiss Light Vertical	Black	Top, Center of chart, Upper & Lower Case; See New Chart 1.4.8
Edition Date, year	00	12	Swiss Light Vertical	Black	Bottom, left corner of chart; Current edition, show only last 2 digits; See New Edition 1.4.5
Edition Number, Month & Day of Date	13th Ed., Dec. 4/	8	Swiss Light Vertical	Black	Current edition, Upper & Lower Case; See New Edition 1.4.5
Elevation, see land contour, rock, coral, spot, etc.					
EPA Established Dump Site	*Dump Site (dredged material) (see note S) Depths from survey of 2000*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*
Exclusive Economic Zone	*EXCLUSIVE ECONOMIC ZONE*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, Also called 200 Nautical Mile Line; See Maritime Boundaries 4.14.7*
Exercise Area	*EXERCISE AREA 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Explosive Anchorage Areas (Federally regulated)	*EXPLOSIVE ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Explosive Dumping Areas (Navy)	*Dumping Ground Explosive*	*7*	*Swiss Light Italic*	*Magenta*	*See Dumping Areas 4.14.5*

F

Feature	Examples	Point Size	Type Style	Color	Remarks
Facility Numbers	10, 10A	9	Swiss Regular Vertical	Magenta	See Facility Standard for updates; See Small Craft Information 7.5
Fairway Anchorage	*FAIRWAY ANCHORAGE 166.200 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Must reference CFR section number & note A; See Safety Fairways 5.9.1*
Fairway, Safety	*SAFETY FAIRWAY 110.251 (see note A)*	*8*	*Swiss Light Italic*	*Magenta*	*Must reference CFR section number & note A; See Safety Fairways 5.9.1*
Fathoms, Soundings	12	7	Swiss Light Vertical	Black	See Soundings 4.3 through Sounding Conversion Tables 4.3.3
Federally Regulated Anchorage Area	*ANCHORAGE AREA NO. 12 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Anchorage Areas 4.14.4*
Feet, Soundings	12	7	Swiss Light Vertical	Black	See Soundings 4.3 through Sounding Conversion Tables 4.3.3
Ferry, Cable	Cable Ferry (see note)	7	Swiss Light Vertical	Black	20% Magenta screened band centered on cable; Upper & Lower Case; See Cable Ferry 5.9.3.2
Ferry Route	*Ferry Route*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Ferry Routes 5.9.3.3; Replaces black on old charts*
Fireboat Station	FIREBOAT STATION	7	Swiss Light Vertical	Black	Upper Case; See Miscellaneous Station 3.9
Firing Area	*MISSILE FIRING AREA 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
First Edition Date & Former Chart Number	Formerly C&GS 1270, 1st Ed., Mar 1921	6	Swiss Light Vertical	Black	Top Center of Chart, Upper & Lower Case; See New Chart 1.4.8
Fish Haven	*Obstn Fish Haven (auth min depth 32 ft)*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Fish Havens 4.12*
Fish Pen	*Fish pen*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Fishing Structures 4.13.2*
Fish Stakes	Fish stakes, Fsh stks	6	Swiss Light Vertical	Black	Upper & Lower Case; Add Fishing & Hunting Structures note; See Fishing Structures 4.13.2
Fish Trap	Fish trap	6	Swiss Light Vertical	Black	Upper & Lower Case; Add Fishing & Hunting Structures note; See Fishing Structures 4.13.2

Feature	Examples	Point Size	Type Style	Color	Remarks
Fish Trap Areas	*Fish Trap Area*	*6*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Miscellaneous Marine Structures 4.14.2*
Fish Weir	Fish weir	6	Swiss Light Vertical	Black	Upper & Lower Case; Add Fishing & Hunting Structures note; See Fishing Structures 4.13.2
Float	*Flt, Float, Float (lighted)*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Floating Structures 4.13.3*
Floating Breakwater	*Breakwater, Bkw*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Floating Structures 4.13.3*
Floating Dry Dock	*Floating Dry dock*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Docks & Tidal Basins 3.5.3*
Floating Pier	*Pier*	*5*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Floating Structures 4.13.3 & Berthing Structures 3.5.1*
Forbidden Anchorage Area	*FORBIDDEN ANCHORAGE AREA 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Anchorage Areas 4.14.4*
Formal Names of Lights	OAK POINT LIGHT	7	Swiss Regular Vertical	Black	Upper Case; Shown on chart when bold in Light List; See Light Characteristics 5.2.2
Former Chart Number & 1st Ed Date	Formerly C&GS 1270, 1st Ed., May 1921	6	Swiss Light Vertical	Black	Top Center, Upper & Lower Case; See New Chart 1.4.8
Foul Area	*Foul*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Rocks 4.9 & Miscellaneous Marine Limits 4.14.2*

G

Feature	Examples	Point Size	Type Style	Color	Remarks
Gage, Tide	Tide gage	6	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix 1
General Notes	Download cell library at: http://ocsnet.ncd.noaa.gov/mcd/scars/scars.htm	7	Swiss Light Vertical	Varies	See Vol 2, Appendix IV, pages 17-20z
Glacier	Glacier	7	Swiss Light Vertical	Black	Upper & Lower Case; See Inland Waters 3.4.3
GP label, Neatline Corner	45°35'12"N 123°24'57"W	5	Swiss Light Vertical	Black	See Vol 2, Appendix IV, page 8
Grass	*Grass*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Foreshore 3.3.2, Vegetation 3.4.6, Misc. Marine Limits 4.14.2*
Gravel	*Gravel, G*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Foreshore 3.3.2*
Green Basketed Soundings, Wire Drag Swept Depths	*Soundings with baskets under them*	*10*	*Swiss Light Italic*	*Green*	*See NOS Surveys 4.2.1, Wire Drags & Sweeps 4.15 through Charting Cleared Depths 4.15.6*
Green Sector	*GREEN, GREEN SECTOR*	*6*	*Swiss Light Italic*	*Black*	*Upper Case, Underline in Green; See Types of Lights 5.2.3*
Grid, Gridiron	*Grid*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Berthing Structures 3.5.1*
Groin	Groin	6	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion Control Structures 3.5.2

H

Feature	Examples	Point Size	Type Style	Color	Remarks
Harbor of Refuge	Black Anchor Symbol		No type used	Black	See Anchorage Areas 4.14.4
Highway Names	King Kamehameha Highway	5	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Historical Areas	FORT JEFFERSON NATIONAL MONUMENT (protected area: 36 CFR 7.27; see note A)	10	Swiss Light Vertical or *Italic*	Blue	*Italic if mostly water area;* CFR section number, reference to Note A & type of area added when applicable*;* See Maritime Boundaries 4.14.7
Horizontal Datum (title block)	North American Datum of 1983	10	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix IV, pages 3-4
Hospital	Hospital, Hosp	7	Swiss Light Vertical	Black	Upper & Lower Case; Buildings & Structures 3.8
Hulk	*Hulk*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Chart No. 1 (F34, K 20)*
Hyacinth boom	*Hyacinth boom*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case*

I

Feature	Examples	Point Size	Type Style	Color	Remarks
Index Diagram Chart Numbers	14500, 19320, 3050	7	Swiss Light Vertical	Black, Blue, or Gold	Black for NOS charts, Blue for NIMA, or Gold for international; See Chart Outlines & Diagrams 2.11
Index Diagram Projection Numbers	120˚30'	7	Swiss Light Vertical	Black	This is for Index Diagram not main charts! See Chart Outlines & Diagrams 2.11
Indian Reservations	NIOMI INDIAN RESERVATION (restricted area: 36 CFR 7.27; see note A)	10	Swiss Light Vertical	Blue	Upper Case; CFR section number, reference to Note A & type of area added when applicable, See Maritime Boundaries 4.14.7
INSET label on Small Craft Charts	INSET	9	Swiss Regular Vertical	Black	Upper Case; See Vol 2, Appendix IV, pages 9-11
Intake, Potable Water	*PWI*	*6*	*Swiss Light Italic*	*Black (formerly Magenta)*	*Upper Case; See Submarine Pipelines (L40.1, L41.1, L43, L44) 4.13.8*
International Boundary Labels (Land)	UNITED STATES	8	Swiss Light Vertical	Black	Upper Case; See Land Boundaries & Limits 3.7
International Boundary Labels (Water)	*UNITED STATES*	*8*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Land Boundaries & Limits 3.7*
(International Maritime Organization Adopted) No Anchoring Area - within other Regulated Area.	 *15 CFR 922.123 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels. Icon is required . Must reference (CFR) title and section numbers; and reference to note A. See NCM section 4.14.4.3*
(International Maritime Organization Adopted) No Anchoring Area - independent area.	 *110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels. Icon is required. Must reference (CFR) title 33 section number & note A. See NCM section 4.14.4.3*
Intracoastal Waterway Name (body of chart, not notes)	*INTRACOASTAL WATERWAY*	*6*	*Swiss Regular Italic*	*Black*	*Upper Case; See Courses 5.8*
Isogonic Line Label	15˚E (3'W) 2001, NO VARIATION (3'W) 2001, 15˚E NO CHANGE 2001	8	Swiss Regular Vertical	Magenta	Upper & Lower Case; See Isogonic Lines 7.3.3; Date should be shown on every 5th line

J

Feature	Examples	Point Size	Type Style	Color	Remarks
Jetty	Jetty	6	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion- Control Structures 3.5.2
JOINS	JOINS CHART 14862	7	Swiss Light Vertical	Black	Upper Case, no parenthesis; See Vol 2, Appendix IV, page 11
Junction Notes	CONTINUED ON CHART 14862	7	Swiss Light Vertical	Black	Upper Case, no parenthesis; See Vol 2, Appendix IV, page 7-11

K

Feature	Examples	Point Size	Type Style	Color	Remarks
Kelp	*Kelp*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Special Bottom Types 4.7.2*

L

Feature	Examples	Point Size	Type Style	Color	Remarks
Lagoon	*Lagoon*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Lakes	*Lake Helen, LAKE SUPERIOR*	*5-36*	*Swiss Regular Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Land Contour labels & Spot Elevations	*200, 400, 1251*	*6*	*Swiss Light Italic*	*Black*	*Change from Vertical type on old charts; See Land Contours 3.4.1*
Land Names, Proper	PT CONCEPTION, Mt Hayes	5-36	Swiss Light Vertical	Black	See Geographic Names 7.4
Landing Area, Sea Plane	*SEA PLANE LANDING AREA 204.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Upper Case, must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Landmark, Accurate	TOWER, TR	6	Swiss Regular Vertical	Black	Upper Case; See Landmarks 6.1 through Labeling of Landmarks 6.1.4
Landmark, Accurate (Lighted)	TOWER (LIGHTED), RADIO TR (LTS)	6	Swiss Regular Vertical	Black	Upper Case, parenthesis around "LIGHTED"; See Landmarks 6.1 through Labeling of Landmarks 6.1.4
Landmark, Approximate	Tower, Tr	6	Swiss Light Vertical	Black	Upper & Lower Case; See Landmarks 6.1 through Labeling of Landmarks 6.1.4
Landmark, Approximate (Lighted)	Tower (R Lt), Tr (R Lt)	6	Swiss Light Vertical	Black	Upper & Lower Case, parenthesis around "lighted"; See Landmarks 6.1 through Labeling of Landmarks 6.1.4
Ledge, Submerged	*Ledge*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Shallow Water Tints 4.5 & Ledges & Reefs 4.8,*
Legends, Channel	*25 FT DEC 2000, 15 ft rep 2000*	*5-8*	*Swiss Light Italic*	*Black*	*Upper Case or Upper & Lower Case; See Tabulations, Legends, & Notes 4.6.1*
Levee	Levee	5	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion-Control Structures 3.5.2
Light Characteristics (USCG Aids to Navigation)	Fl (3) R 10s 85ft 10M "12"	7	Swiss Regular Vertical	Black	See Light Characteristics 5.2.2; If not an aid to navigation see Markers 5.6
Light Names, Formal	OAK POINT LIGHT	7	Swiss Regular Vertical	Black	Upper Case; Shown on chart when bold in Light List; See Light Characteristics 5.2.2
Light Sectors	*RED SECTOR, RED*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; Underline Using color of sector; See Types of Lights 5.2.3*

Feature	Examples	Point Size	Type Style	Color	Remarks
Line Labels see individual lines: Loran, Closing, Territorial, Natural Resource, Three Mile, etc					
Locks Clearances	SHIP LOCK WIDTH 86 FT LENGTH 675 FT DEPTH 19 FT	5	Swiss Light Vertical	Black	Upper Case; See Locks & Other Barriers 3.5.4
Log	*Snag*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Dangers 4.11.1, Natural Dangers 4.11.4*
Log Boom	*Log boom*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Logging Structures 4.13.4*
Loran Line labels	4990X, 4990Y, 4990Z	7	Swiss Light Vertical	Varies	Letters are Upper Case; See LORAN-C 6.5.1
LT OBSC	*LT OBSC*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Types of Lights 5.2.3*

M

Feature	Examples	Point Size	Type Style	Color	Remarks
Mangrove	Mangrove	6	Swiss Light Vertical	Black	Upper & Lower Case; Marshes & Swamps 3.4.7
Margin, Sounding Unit - Fathoms & Feet to 11 Fathoms	(FATHOMS & FEET TO 11 FATHOMS)	10	Swiss Regular Vertical	Magenta	Upper Case; Magenta only for Fathoms & Feet to 11 fathoms; See Vol 2, Appendix IV, pages 7-8
Margin, Sounding Unit (except Fathoms & feet to 11fms)	SOUNDINGS IN FEET	8	Swiss Light Vertical	Black	Upper Case, English Charts See Vol 2, Appendix IV, page 8
Marine Police Station	MARINE POLICE	7	Swiss Light Vertical	Black	Upper Case; See Miscellaneous Stations 3.9
Marine Railway	Marine Railway	5	Swiss Light Vertical	Black	Upper Case; See Landing & Launching Sites 3.5.5
Marine Sanctuaries	*LOOE KEY NATIONAL MARINE SANCTUARY (protected area: 15 CFR 9.37; see note A)*	*10*	*Swiss Light Italic*	*Blue*	*CFR section number, reference to Note A & type of area added when applicable, See Maritime Boundaries 4.14.7*
Marker	Marker	6	Swiss Light Vertical	Black	Upper & Lower Case; See Markers 5.6, Miscellaneous Marine Structures 4.13.6
Marsh	Marsh	6	Swiss Light Vertical	Black	Upper & Lower Case; See Marshes & Swamps 3.4.7
Masts (wrecks - not radio, TV etc)	*Masts*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Sunken Wrecks 4.10.2*
Measured Nautical Mile	*MEASURED NAUTICAL MILE COURSE 150°15' TRUE*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Trial Courses 5.8.2*
Metric Soundings	*12*	*7*	*Swiss Light Italic*	*Black*	*See Soundings 4.3 through Sounding Conversion Tables 4.3.3*

Feature	Examples	Point Size	Type Style	Color	Remarks
Mileage label, Course Line	*St M 125*	*7*	*Swiss Regular Italic*	*Magenta*	*Usually at 1 & 5 mile intervals; Upper & Lower Case; See Courses 5.8*
Military Anchorage Areas	*EXPLOSIVE ANCHORAGE NO. 12 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Minutes (Projection Numbers)	12'	9	Swiss Regular Vertical	Black	See Border Scales 2.10.1
Missile Test Area	*MISSILE TEST AREA 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Mud	*Mud*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Foreshore 3.3.2*

N

Feature	Examples	Point Size	Type Style	Color	Remarks
National Park	*EVERGLADES NATIONAL PARK (protected area: 15 CFR 7.54; see note A)*	*10*	*Swiss Light Italic* or Vertical	*Blue*	*Italic if mostly water; CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7*
National Seashore	PAJARO DUNES NATIONAL SEASHORE (protected area: 15 CFR 7.54; see note A)	10	Swiss Light Vertical	Blue	CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
Natural Resources Boundary (3-League Line)	*NATURAL RESOURCE BOUNDARY (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*See Maritime Boundaries 4.14.7*
Nautical Mile Line, Three	*THREE NAUTICAL MILE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*See Maritime Boundaries 4.14.7*
Nautical Mile Line, Twelve	*TERRITORIAL SEA & CONTIGUOUS ZONE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*See Maritime Boundaries 4.14.7*
Navy Established Dumping Areas	*Dumping Ground Chemical*	*7*	*Swiss Light Italic*	*Magenta*	*Label "Disused" if no longer in use; See Dumping Areas 4.14.5*
Neatline Dimensions (Margin)	1134.0 X 794.0 mm	5	Swiss Light Vertical	Black	See Vol 2, Appendix IV, page 8
Nine Nautical Mile Line	*NATURAL RESOURCE BOUNDARY (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case; See Maritime Boundary 4.14.7*
No Anchoring Area (IMO Adopted; within other Regulated Area)	 *15 CFR 922.123 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels. Icon is required . Must reference CFR title and section numbers; and reference to note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*

Feature	Examples	Point Size	Type Style	Color	Remarks
No Anchoring Area (IMO Adopted; independent area)	 *110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels). Icon is required. Must reference CFR title 33 section number & note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*
North American Datum of 1983 (title block)	North American Datum of 1983	10	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix IV, pages 3-4
Notes, Standard	Download notes cell library at http://ocsnet.ncd.noaa.gov/mcd/scars/scars.htm	7	Swiss Light Vertical	Varies	See Vol 2, Appendix IV, pages 17-20z

O

Feature	Examples	Point Size	Type Style	Color	Remarks
Obstructions	*Obstn*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Obstructions 4.11 & Miscellaneous Dangers 4.11.1*
Old Chart Number & 1st Ed Date	Formerly C&GS 1270, 1st Ed., May 1921	6	Swiss Light Vertical	Black	Top Center, Upper & Lower Case; See New Chart 1.4.8
Operating Area	*OPERATING AREA "R 6701" (see note C)*	*8*	*Swiss Regular Italic*	*Magenta*	*Upper Case; See Miscellaneous Marine Limits 4.14.2*
Ordnance, Unexploded	*Unexploded Ordnance (Reported 1945)*	*7*	*Swiss Light Italic*	*Black*	*If type of Ordnance is known (e.g., bomb), chart with black 6 pt Swiss light italic;*
Outlined Chart label (limits of large scale charts drawn on small scale ones)	14500, 19320, 3050	12	Swiss Light Vertical	Black, Blue, or Gold	Black for NOS charts, Blue for NIMA, or Gold for international; See Chart Outlines & Diagrams 2.11
Overhead Power Cable	OVHD PWR CAB AUTH CL 34 FT	5	Swiss Light Vertical	Black	Upper Case; See Overhead Cables & Crossings 3.11.2
Oyster Reef or Bed	*Oyster Reef, Oyster Bed*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Ledges & Reefs 4.8*

P

Feature	Examples	Point Size	Type Style	Color	Remarks
PAGE label on Small Craft Charts	PAGE B	9	Swiss Regular Vertical	Black	Upper Case; See Vol 2, Appendix IV, pages 9-11
PANEL label on Small Craft Charts	PANEL	9	Swiss Regular Vertical	Black	Upper Case; See Vol 2, Appendix IV, pages 9-11
Park, Land	EVERGLADES NATIONAL PARK (protected area: 15 CFR 7.54; see note A)	10	Swiss Light Vertical	Blue	CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
Park, Water	*EVERGLADES NATIONAL PARK (protected area: 15 CFR 7.54; see note A)*	*10*	*Swiss Light Italic*	*Blue*	CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
Particularly Sensitive Sea Areas	*PARTICULARLY SENSITIVE SEA AREA*	10	*Swiss Light Italic*	*Green*	*Charted within the limits of the PSSA; oriented along the screened band. See NCM section 4.14.7*
Peaks	*1251*	*6*	*Swiss Light Italic*	*Black*	*See Land Contours 3.4.1*
Pens, Crab or Fish	*Crab pen, Fish pen*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Fishing Structures 4.13.2*
Pier	Pier	5	Swiss Light Vertical	Black	Upper & Lower Case; See Berthing Structures 3.5.1
Pile, above SPOR	Pile	6	Swiss Light Vertical	Black	Upper & Lower Case; See Mooring Structures 4.13.7
Pile or Piling, submerged or uncovers	*Subm pile, Subm piling, Subm piles*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Mooring Structures 4.13.7*
Piling	Piling	6	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix 1
Pilot Boarding Area	*PILOT AREA*	*8*	*Swiss Regular Italic*	*Magenta*	*Upper Case, when used with landmark symbol; See Traffic Schemes 5.9.2.2*
Pilot Operating Area	*LOS ANGELES PILOT OPERATING AREA (see notes D and G)*	*8*	*Swiss Regular Italic*	*Magenta*	*See Traffic Schemes 5.9.2.2*

Feature	Examples	Point Size	Type Style	Color	Remarks
Pilot Station	PIL STA, PILOT STATION, Pilot Station	6	Swiss Light or Regular Vertical	Black	Upper Case, regular type when used with accurate landmark symbol; See Miscellaneous Stations 3.9
Pipe	Pipe	6	Swiss Light Vertical	Black	Upper & Lower Case; See Mineral Development Structures 4.13.5 & Miscellaneous Marine Structures 4.13.6
Pipe, Overhead - Clearances	OVHD PIPE AUTH CL 56 FT	5	Swiss Light Vertical	Black	Upper Case; See Chart No. 1 (D 28)
Pipeline Area	*Pipeline Area*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Cable & Pipeline Areas 4.14.3*
Pipeline Area, Abandoned	*Abandoned Pipeline Area*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case; See Cable & Pipeline Areas 4.14.3*
Platform	Platform	6	Swiss Light Vertical	Black	Upper & Lower Case; See Mineral Development Structures 4.13.5
Platform Designator / Name	"SRC-WD-17-2"	6	Swiss Regular Vertical	Black	Upper Case; See Platforms & Cribs 4.13.1; Mineral Development Structures 4.13.5
Pocketfold Chart Cover (or Regular Small Craft)	**Bellingham to Everette including San Juan Islands**	**36**	**Swiss Bold**	**Black**	**See Vol 2, Appendix IV, page 6**
Pole	Pole	6	Swiss Light Vertical	Black	Upper & Lower Case; See Miscellaneous Marine Structures 4.13.6

Feature	Examples	Point Size	Type Style	Color	Remarks
Police Station, Marine	MARINE POLICE	7	Swiss Light Vertical	Black	Upper Case; See Miscellaneous Stations 3.9
Pond	*Pond*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Post	Post	6	Swiss Light Vertical	Black	Upper & Lower Case; See Miscellaneous Marine Structures 4.13.6
Potable Water Intake	*PWI*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Submarine Pipelines 4.13.8*
Power Cable, Overhead	OVHD PWR CAB AUTH CL 47 FT	5	Swiss Light Vertical	Black	Upper Case; See Overhead Cables & Crossings 3.11.2
Precautionary Area	*PRECAUTIONARY AREA* *(see note _)*	*7*	*Swiss Light Italic*	*Magenta*	*See Traffic Schemes 5.9.2*
Previous Chart Number & 1st Ed Date	Formerly C&GS 1270, 1st Ed., May 1921	6	Swiss Light Vertical	Black	Top Center, Upper & Lower Case; See New Chart 1.4.8
Prohibited Anchorage Area	*PROHIBITED ANCHORAGE AREA* *110.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Anchorage Areas 4.14.4*
Prohibited Anchorage Area (IMO Adopted; within other Regulated Area)	 *15 CFR 922.123* *(see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels). Icon is required . Must reference CFR title and section numbers; and reference to note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*
Prohibited Anchorage Area (IMO Adopted; independent area)	 *110.224* *(see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Prohibited to ALL vessels). Icon is required. Must reference CFR title 33 section number & note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*
Projection Numbers - Degrees	120˚	12	Swiss Regular Vertical	Black	See Border Scales 2.10.1

Feature	Examples	Point Size	Type Style	Color	Remarks
Projection Numbers - Minutes	12'	9	Swiss Regular Vertical	Black	See Border Scales 2.10.1
Projection Numbers - Seconds	20"	6	Swiss Light Vertical	Black	See Border Scales 2.10.1
Projection Numbers, Index Diagram	120˚30'	7	Swiss Light Vertical	Black	This is for Index Diagram not main charts! See Chart Outlines & Diagrams 2.11
Protected Areas	FORT JEFFERSON NATIONAL MONUMENT (protected area: 36 CFR 7.27; see note A)	10	Swiss Light Vertical or *Italic*	Blue	*Italic if mostly water area;* CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
Provisional Chart Label	PROVISIONAL CHART	10	Swiss Regular Vertical	Black	Put label at least 2 places on chart, Upper Case; See Provisional Chart 1.4.10
Pump-out Facilities	Pump-out facilities	8	Swiss Light Vertical	Magenta	See Miscellaneous Stations 3.9
PWI	*PWI*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Submerged Pipelines 4.13.8*

Q

Feature	Examples	Point Size	Type Style	Color	Remarks
Quarantine Anchorage Areas (Federally regulated)	*QUARANTINE ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*

R

Feature	Examples	Point Size	Type Style	Color	Remarks
Railroad	RR, Railroad	5	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Railway	Ry, Railway	5	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Ramp (on Conventional Charts)	Ramp	6	Swiss Light Vertical	Black	See Landing & Launching Sites 3.5.5
Ramp (on Facilities Charts)	Ramp	7	Swiss Light Vertical	Magenta	See Facility Standard for updates to Facility Charts; See Landing & Launching Sites 3.5.5
Range Names & Bearings	*Lights in line 090°*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Ranges 5.7; Chart only if shown in the Light List*
Ranges	*RANGE A*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Ranges 5.7; Chart only if shown in the Light List*
Rapids	*Rapids*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Red Sector	*RED, RED SECTOR*	*6*	*Swiss Light Italic*	*Black*	*Upper Case, Underline in Magenta; See Types of Lights 5.2.3*
Reef	*Reef*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Ledges & Reefs 4.8*
Refuge, Wildlife	GREAT WHITE HERON WILDLIFE REFUGE (protected area: 15 CFR 922; see note A)	10	Swiss Light Vertical or *Italic*	Blue	*Italic if mostly water area;* CFR section number, reference to Note A & type of area added when applicable, See Maritime Boundaries 4.14.7
Reported	*Reported, Rep, Rep (2000), 3 ft rep*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Misc Surveys 4.2.3; Tabs Legends, & Notes 4.6.1; Questionable Dangers 4.11.3*

Feature	Examples	Point Size	Type Style	Color	Remarks
Reservations	OSWEGO INDIAN RESERVATION (protected area: 36 CFR 7.27; see note A)	10	Swiss Light Vertical	Blue	CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
Restricted Areas	*RESTRICTED AREA 110.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Restricted Anchorage Areas (Federally regulated)	*RESTRICTED ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Restricted Anchorage Area (IMO Adopted; within other Regulated Area)	 *RESTRICTED ANCHORAGE 15 CFR 922.123 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*RESTRICTED for some vessels. Icon is required . Must reference CFR title and section numbers; and reference to note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*
Restricted Anchorage Area (IMO Adopted; independent area)	 *RESTRICTED ANCHORAGE 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*RESTRICTED for some vessels. Icon is required. Must reference (CFR) title 33 section number & note A. Also referred to as (IMO adopted) No Anchoring Area. See NCM section 4.14.4.3*
Revetment Area	*REVETMENT AREA 161.402 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Must reference CFR section number & note A*
Rips, Tide	*Tide rips*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; Currents 7.2*
River, Proper Water Names	*Yukon River, POTOMAC RIVER*	*5-36*	*Swiss Regular Italic*	*Black*	*See Inland Waters 3.4.3*
Road Names	Sunset Blvd	5	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Rock ledge	*Rock*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; Foreshore 3.3.2*
Rock or Coral that Uncovers, Elevation of	(2)	6	Swiss Light Vertical	Black	In Parenthesis, Underlined; See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2

Feature	Examples	Point Size	Type Style	Color	Remarks
Rock, Bare: Proper Name of	Makhnati Rock	6-12	Swiss Regular Vertical	Black	See Geographic Names 7.4
Rock, Submerged or Rock Awash, Proper Name of	*Sandy Point Rock*	*6-12*	*Swiss Regular Italic*	*Black*	*See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2*
Rocks Bare, Elevations	*(2)*	*6*	*Swiss Light Italic*	*Black*	*In parenthesis; See Heights & Depths of Rocks 4.9.2*
Rocks that cover & uncover, Elevations	(2)	6	Swiss Light Vertical	Black	In Parenthesis, Underlined; See Ledges & Reefs 4.8 through Heights & Depths of Rocks 4.9.2
Route, Ferry	*Ferry Route*	*7*	*Swiss Light Italic*	*Magenta*	*Upper & Lower Case, See Ferry Routes 5.9.3.3*
Ruins, Awash	*Ruins*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Berthing Structures 3.5.1, Platforms & Cribs 4.13.1, & Misc Marine Limits 4.14.2*
Ruins, Submerged at all times	*Subm ruins*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Berthing Structures 3.5.1, Platforms & Cribs 4.13.1, & Misc Marine Limits 4.14.2*
Ruins, Visible/Bare	Ruins	6	Swiss Light Vertical	Black	Upper & Lower Case; See Berthing Structures 3.5.1, Platforms & Cribs 4.13.1, & Misc Marine Limits 4.14.2

S

Feature	Examples	Point Size	Type Style	Color	Remarks
Safety Fairway	*SAFETY FAIRWAY 110.224 (see note A)*	*8*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Safety Fairways 5.9.1*
Safety Zone	*SAFETY ZONE 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Federally Regulated Areas 4.14.1*
Salt Pan	*Salt pan*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Sanctuaries, Marine	*FLORIDA KEYS NATIONAL MARINE SANCTUARY (protected area: 15 CFR 922; see note A)*	*10*	*Swiss Light Italic*	*Blue*	*CFR section number, reference to Note A & type of area added when applicable, See Maritime Boundaries 4.14.7*
Sand	*Sand*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; Foreshore 3.3.2*
Sandwave	*Pictorial symbol only (J 14)*			*Black*	*See Special Bottom Types 4.7.2*
Sandy	*Sandy*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; Shoreline Plane of Reference 3.3.1*
Scale by Subtitle (Margin not title block)	SCALE 1:10,000	8	Swiss Light Vertical	Black	Upper Case, See Vol 2, Appendix IV, page 8
Scuba Diving Area	*Scuba Diving Area*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*
Seaplane Anchorage	*SEAPLANE ANCHORAGE 110.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Anchorage Areas 4.14.4*
Seaplane Landing Area	*SEAPLANE LANDING AREA 204.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; Federally Regulated Areas 4.14.1*

Feature	Examples	Point Size	Type Style	Color	Remarks
Seaplane Restricted Areas	*SEAPLANE RESTRICTED AREA 110.224 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Seawall	Seawall	6	Swiss Light Vertical	Black	Upper & Lower Case; See Erosion-Control Structures 3.5.2
Seaweed	*Seaweed*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Special Bottom Types 4.7.2*
Seconds (Projection Numbers)	20"	6	Swiss Light Vertical	Black	See Border Scales 2.10.1
Sector, Green	*GREEN SECTOR, GREEN*	*6*	*Swiss Light Italic*	*Black*	*Upper Case, Underline in Green; See Types of Lights 5.2.3*
Sector, Red	*RED SECTOR, RED*	*6*	*Swiss Light Italic*	*Black*	*Upper Case, Underline in Magenta; See Types of Lights 5.2.3*
Sectors, Light	*RED SECTOR, RED*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Types of Lights 5.2.3, Underline with appropriate color*
Security Zone	*SECURITY ZONE*	*7*	*Swiss Light Italic*	*Magenta*	*Upper Case; See Federally Regulated Areas 4.14.1*
SEDIMENT TRAP	*SEDIMENT TRAP (see note)*	*7*	*Swiss Light Italic*	*Black*	*Upper Case; Lower Case*
see note	*(see note), (see note)*	*6*	*Swiss Light Italic*	*Black or Magenta*	*Lower Case, in parenthesis; Color depends on color of referenced note; See Tabs, Legends, & Notes 4.6.1; Federally Regulated Areas 4.14.1; Anchorage Areas 4.14.4; COLREGS Demarcation Line 4.14.6*
Separation Scheme, Traffic	*TRAFFIC SEPARATION SCHEME (see note F),* *VESSEL TRAFFIC SERVICE 161.101 - 161.189 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Must reference CFR section number & note A if in CFR. If not in CFR, reference to next available alpha character after assigning same alpha character to respective note; See Traffic Schemes 5.9.2*
Separation Zone	*SEPARATION ZONE*	*7*	*Swiss Light Italic*	*Magenta*	*Upper Case; Separation Schemes 5.9.2*
Sewer	*Sewer*	*5*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Submarine Pipelines 4.13.8 (outfall not used)*
Shoal	*Shoal*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Tabs, Legends, & Notes 4.6.1*
Shrimp Farm	*Shrimp Farm*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*
SIDE label on Small Craft charts	SIDE A	9	Swiss Regular Vertical	Black	Upper Case; See Vol 2, Appendix IV, pages 9-11

Feature	Examples	Point Size	Type Style	Color	Remarks
Sign	Sign	6	Swiss Light Vertical	Black	Upper & Lower Case; See Miscellaneous Marine Structures 4.13.6
Sign Designator/Name on Platform	"SRC-WD-17-2"	6	Swiss Regular Vertical	Black	Upper Case, Quotes; See Platforms & Cribs 4.13.1; Mineral Development Structures 4.13.5
Small Craft Chart Numbers	18423	12	Swiss Regular Vertical	Black	See Vol 2, Appendix IV, pages 9-11
Small Craft Anchorage Areas (Federally regulated)	*SMALL CRAFT ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Small Craft Chart Cover (Regular or Pocketfold)	**Bellingham to Everette including San Juan Islands**	**36**	**Swiss Bold**	**Black**	**See Vol 2, Appendix IV, page 6**
Small Craft Facility Numbers	10, 10A	9	Swiss Regular Vertical	Magenta	See Facility Standard for updates; See Small Craft Information 7.5
Snag	*Snag*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Dangers 4.11.1, Natural Dangers 4.11.4*
SOUNDINGS IN FATHOMS, FEET, METERS, etc.	SOUNDINGS IN FATHOMS	8	Swiss Light Vertical	Black	Title Block, See Vol 2, Appendix IV, pages 3-4

Feature	Examples	Point Size	Type Style	Color	Remarks
Soundings: Feet, Fathoms	12	7	Swiss Light Vertical	Black	See Soundings 4.3 through Sounding Conversion Tables 4.3.3
Soundings: Meters	*12*	*7*	*Swiss Light Italic*	*Black*	See Soundings 4.3 through Sounding Conversion Tables 4.3.3
Special Anchorage Areas (Federally regulated)	*SPECIAL ANCHORAGE AREA 110.1, 110.126a (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Spoil Area (USACE)	*Spoil Area*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Dumping Areas 4.14.5*
Spot Elevation	*1251*	*6*	*Swiss Light Italic*	*Black*	*See Land Contours 3.4.1*
Stake	Stake	6	Swiss Light Vertical	Black	Upper & Lower Case; See Miscellaneous Marine Structures 4.13.6
Standard notes	Download notes cell library at: http://ocsnet.ncd.noaa.gov/mcd/scars/scars.htm	7	Swiss Light Vertical	Varies	See Vol 2, Appendix IV, pages 17-20z
State Boundary Labels	OHIO	8	Swiss Light Vertical	Black	Shown on Land Areas only; See Land Boundaries & Limits 3.7
State Parks	FLORIDA EVERGLADES STATE PARK (protected area: 15 CFR 7.54; see note A)	10	Swiss Light Vertical *or Italic*	Blue	*Italic if mostly water area;* CFR section number, reference to Note A & type of area added when applicable; See Maritime Boundaries 4.14.7
State Plane Coordinate Grid Numbers	10 000, 20 000, 30 000	5	Swiss Light Vertical	Black	No commas; See Grids 2.9.2

Feature	Examples	Point Size	Type Style	Color	Remarks
Station see individual stations: Fireboat, Marine Police, Pilot, Survey, Tide, Coast Guard, Radio, TV, Radar					
Stony	Stony	6	Swiss Light Vertical	Black	Upper & Lower Case; Shoreline Plane of Reference 3.3.1
Stream	*Stream*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Street Names	Sunset Blvd	5	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Stump	*Stump*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Natural Dangers 4.11.4*
Subm piles, dols, etc.	*Subm pile, Subm dol*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Mooring Structures 4.13.7*
Subm, Submerged	*Subm*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Mooring Structures 4.13.7*
Submerged see individual items: breakwater, ruins, dry dock, float, obstructions, ledge, crib					
Subtitle (Margin not title block)	Charleston	14	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix IV, page 8
Swamp	Swamp	6	Swiss Light Vertical	Black	Upper & Lower Case; See Marshes & Swamps 3.4.7 & Shoreline Plane of Reference 3.3.1
Swept Depths	*Soundings with baskets under them*	*10*	*Swiss Light Italic*	*Green*	*See NOS Surveys 4.2.1, Wire Drags & Wire Sweeps 4.15 through 4.15.6*
Swimming & Diving Area	*Swimming & Diving Area*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*

T

Feature	Examples	Point Size	Type Style	Color	Remarks
Tank (as building not landmark)	Tank	7	Swiss Light Vertical	Black	Upper & Lower Case; See Buildings & Structures 3.8 & Chart No. 1 (E32)
Temporary Anchorage Areas (Federally regulated)	*TEMPORARY ANCHORAGE AREA 110.224 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*See Anchorage Areas 4.14.4*
Territorial Sea & Contiguous Zone (12 mile line)	*TERRITORIAL SEA & CONTIGUOUS ZONE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Maritime Areas 4.14.7*
Territorial Sea Labels (Closing Line)	*TERRITORIAL SEA (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Maritime Areas 4.14.7*
Test Area, Missile	*MISSILE TEST AREA 334.970 (see note A)*	*8*	*Swiss Regular Italic*	*Magenta*	*Must reference CFR section number & note A; See Federally Regulated Areas 4.14.1*
Three League Line (Natural Resources Boundary)	*NATURAL RESOURCE BOUNDARY (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Maritime Areas 4.14.7*
Three Nautical Mile Line	*THREE NAUTICAL MILE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case; See Maritime Areas 4.14.7*
Tidal Basin	*Tidal basin*	*6*	*Swiss Regular Italic*	*Black*	*Upper & Lower Case; See Docks & Tidal Basins 3.5.3*
Tide Gage	Tide gage	6	Swiss Light Vertical	Black	Upper & Lower Case; See Vol 2, Appendix 1
Tide Rips	*Tide rips*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Currents 7.2*
Topographic Contour Label	*200, 400*	*6*	*Swiss Light Italic*	*Black*	*Change from Vertical type on old charts; See Land Contours 3.4.1*
Tracks/Courses, Trial (differs from other courses)	*TRIAL COURSE 6065 FT COURSE 18°49' - 198°49' TRUE*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Trial Courses (Q122) 5.8.2*

Feature	Examples	Point Size	Type Style	Color	Remarks
Traffic Separation Scheme	*VESSEL TRAFFIC SERVICE 161.101 - 161.189 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Upper Case; must reference CFR section number & note A if in CFR. If not in CFR, reference to next available alpha character after assigning same alpha character to respective note; See Traffic Schemes 5.9.2*
Treetop Elevation	*51 TT*	*6*	*Swiss Light Italic*	*Black*	*SE Alaska only; See Land Contours 3.4.1*
Trial Courses (differs from other courses)	*TRIAL COURSE 6050 FT COURSE 18°49' - 168°49' TRUE*	*6*	*Swiss Light Italic*	*Black*	*Upper Case; See Trial Courses (Q122) 5.8.2*
Tunnel	Tunnel	6	Swiss Light Vertical	Black	Upper & Lower Case; See Man-Made Features 3.6
Tunny nets	*Tunny nets*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Fishing Structures 4.13.2*
Twelve Nautical Mile Line	*TERRITORIAL SEA & CONTIGUOUS ZONE (see note X)*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, See Section Maritime Boundaries 4.14.7*
Two Hundred Nautical Mile Exclusive Economic Zone	*EXCLUSIVE ECONOMIC ZONE*	*7*	*Swiss Regular Italic*	*25% Screened Black*	*Upper Case, Also called 200 Nautical Mile Line; See Maritime Boundaries 4.14.7*

U

Feature	Examples	Point Size	Type Style	Color	Remarks
Uncovers	*Uncovers*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Heights & Depths of Rocks 4.9.2*
Under Construction, Bridge	Bridge under construction	6	Swiss Light Vertical	Black	See Bridges 3.11.1
Under Water Obstructions (below SPOR)	*Obstn*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Obstructions 4.11 & Miscellaneous Dangers 4.11.1*
Unexploded Ordnance	*Unexploded Ordnance (Reported 1945)*	*7*	*Swiss Light Italic*	*Black*	*If type of Ordnance known (e.g., bomb) chart with black 6 pt light italic; Miscellaneous Marine Limits 4.14.2*
United States (title block)	UNITED STATES	12	Swiss Regular Vertical	Black	Upper Case; See Appendix IV, pages 3-4
Units, Sounding: Margin (except when fms & ft to 11fms)	SOUNDINGS IN FEET	8	Swiss Light Vertical	Black	Upper Case, English Charts; See Vol 2, Appendix IV, page 8
Unsurveyed Area	*Unsurveyed*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Maritime Limits 4.14.2*
US Coast Guard, Station	CG, PT REYES COAST GUARD	7	Swiss Light Vertical	Black	Upper Case, See Miscellaneous Stations 3.9; Use name of station for Coastal & larger scale charts
Use Chart	*(use chart 14823), (use chart 14823)*	*6*	*Swiss Light Italic*	*Black or Magenta*	*Lower Case, in parenthesis, black when no hydro*

V

Feature	Examples	Point Size	Type Style	Color	Remarks
Vessel Traffic Services	*VESSEL TRAFFIC SERVICES 161.101 - 161.189 (see note A)*	*7*	*Swiss Light Italic*	*Magenta*	*Must reference CFR section number & note A; See Traffic Schemes 5.9.2*
Visible Ruins	Ruins	6	Swiss Light Vertical	Black	Upper & Lower Case; See Berthing Facilities 3.5.1, Platforms & Cribs 4.13.1, Miscellaneous Marine Limits 4.14.2
Volcano	Volcano, Vol	7	Swiss Light Vertical	Black	Upper & Lower Case; See Geographic Names 7.4
Volcano, Submerged	*Subm vol*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Miscellaneous Marine Limits 4.14.2*

W

Feature	Examples	Point Size	Type Style	Color	Remarks
Water Names, Proper	*San Francisco Bay, SAN JUAN RIVER*	*5-36*	*Swiss Regular Italic*	*Black*	*See Geographic Names 7.4*
Waterfall	*Waterfall*	*7*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Inland Waters 3.4.3*
Waterway Name, Intracoastal	*INTRACOASTAL WATERWAY*	*6*	*Swiss Regular Italic*	*Black*	*Upper Case; See Courses 5.8*
Well	*Well*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Mineral Development Structures 4.13.5*
Wet Dock	*Wet dock*	*6*	*Swiss Regular Italic*	*Black*	*Upper & Lower Case; See Docks & Tidal Basins 3.5.3*
Wharf	Wharf	5	Swiss Light Vertical	Black	Upper & Lower Case; See Berthing Structures 3.5.1
Wire Drag Swept Depths	*Soundings with baskets under them*	*10*	*Swiss Light Italic*	*Green*	*See NOS Surveys 4.2.1, Wire Drags & Wire Sweeps 4.15 through 4.15.6*
World Geodetic System 1984 (in title block)	(World Geodetic System 1984)	8	Swiss Light Vertical	Black	Upper & Lower Case, Parentheses; See Vol 2, Appendix IV, pages 3.4
Wreck	*Wk, Wks, Wreck*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Wrecks 4.10*
Wreckage	*Wreckage*	*6*	*Swiss Light Italic*	*Black*	*Upper & Lower Case; See Wrecks 4.10*

Z

Feature	Examples	Point Size	Type Style	Color	Remarks
Zone, see Safety, Security, Separation, Exclusive Economic, etc.					