

Introduction

Operational Forecast Systems (OFS) are national networks of operational nowcast and forecast models to support NOAA's mission goals and priorities. An OFS consists of the automated integration of observing system data streams, hydrodynamic model predictions, product dissemination and continuous quality control monitoring. Nowcasts and forecasts are scientific predictions about the present and near future states of a coastal marine environment or region. Additional information and data are available in NetCDF format from the following site: <https://tidesandcurrents.noaa.gov/models.html>

OFS S111 HDF5 Project

The National Oceanic and Atmospheric Administration (NOAA)/National Ocean Service (NOS)/Office of Coast Survey (OCS)/Coast Survey Development Lab (CSDL) is providing a service for disseminating NOS Operational Forecast System (OFS) surface current information in the International Hydrographic Organization (IHO) S-100 standard format. S-111 is an IHO standard under S-100 that outlines formats for storing and sending water current data and metadata, designed for interoperability with Electronic Navigation Charts and other IHO S-100 product specifications. S-111 aims to standardize surface currents for use in navigation systems in order to improve Navigation Decision Support for mariners.

The S-100/S-111 compliant HDF5 datasets produced by CSDL have been converted to a regular grid and subsetted to provide an easily digestible size and format for consumption by Electronic Chart Systems such as Electronic Chart Display and Information Systems (ECDIS), portable pilot units (PPU), and electronic charting systems (ECS). Subsequent development efforts will include conversion to IHO S-104 standard format for water level data.

Currently, S-111 HDF5 datasets are being produced for the Chesapeake Bay Operational Forecast System (CBOFS). The S-111 HDF5 datasets for the other OFS across the U.S. are under development and will be posted as they become available.

Operational Deployment

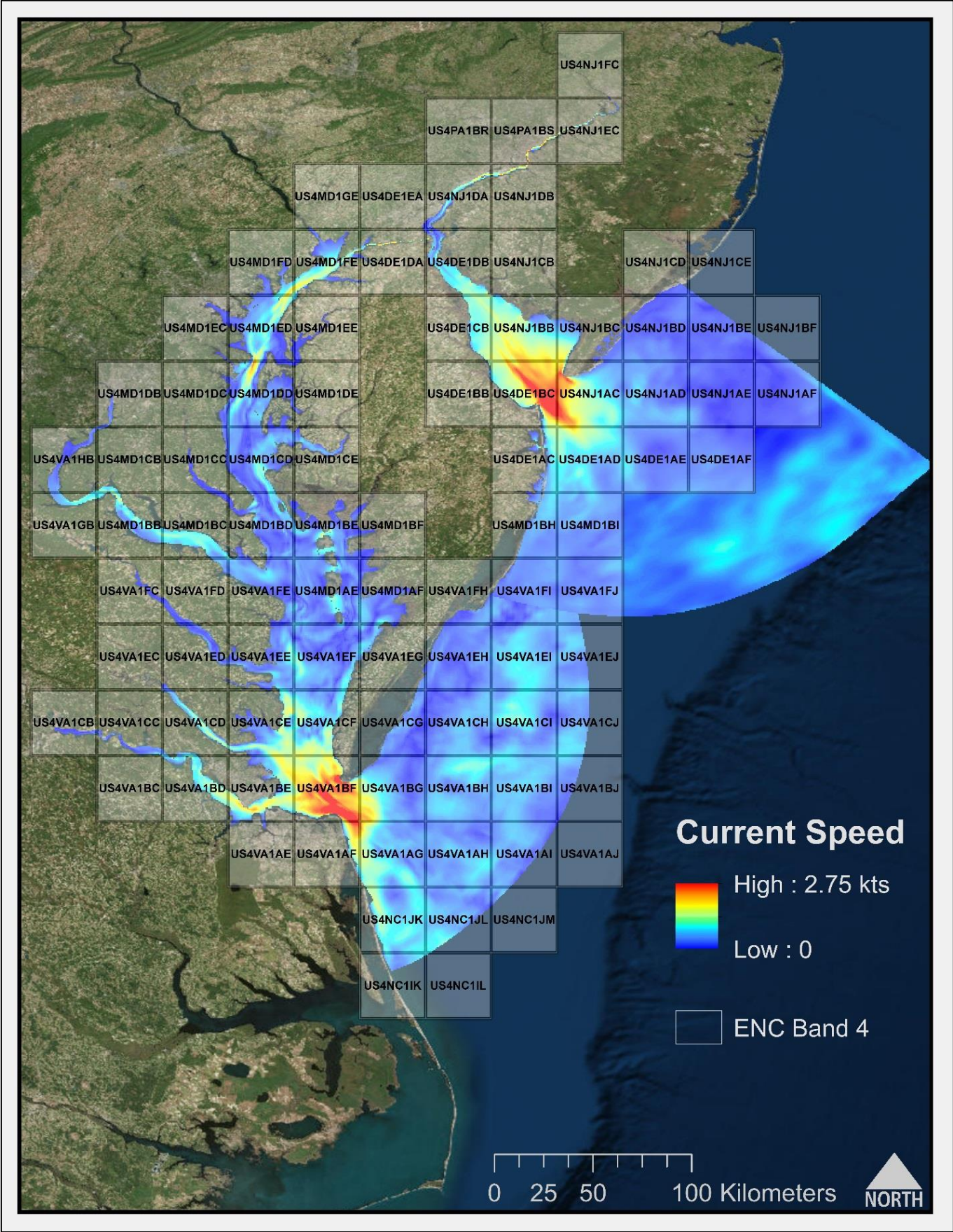
HDF5 Files are produced every 6 hours following each CBOFS model run cycle. The full forecast period is downloaded in its native ROMS NetCDF format, interpolated to a regular grid, and appended to a single S-111 HD5 file (for a default grid) or a set of Band 4 S-111 HDF5 files, one HDF5 file per ENC cell with OFS coverage (see map below). Each S-111 HDF5 file contains 48-hour forecast projections for each forecast cycle. Currents are interpolated to a depth of 4.5m below the sea surface, and half the depth of the water column for areas shallower than 9m.

File Specifications

Chesapeake Bay Operational Forecast System (CBOFS)	
IHO Specifications	S-100 Edition 4.0.0 S-111 Edition 1.0.0
Format	HDF5
Model	ROMS
Observation	Water Currents
Coordinate System	WGS 84
Time Zone	UTC
Forecast	48 hours
Resolution	~500 m
Depth	4.5 m
Data Coverage	Chesapeake Bay VA/MD
HDF5 Files	63

Delaware Bay Operational Forecast System (DBOFS)	
IHO Specifications	S-100 Edition 4.0.0 S-111 Edition 1.0.0
Format	HDF5
Model	ROMS
Observation	Water Currents
Coordinate System	WGS 84
Time Zone	UTC
Forecast	48 hours
Resolution	~500 m
Depth	4.5 m
Data Coverage	Delaware Bay DE/NJ/PA
HDF5 Files	27

NOAA/NOS/Office of Coast Survey/Marine Chart Division (MCD)
MCD Re-scheming ENC - Band 4 Cells covering Chesapeake Bay OFS & Delaware Bay OFS



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More Information

IHO S-111 (surface currents) and S-104 (water level):

https://www.iho.int/srv1/index.php?option=com_content&view=article&id=630&Itemid=371&lang=en

IHO S-100: https://iho.int/iho_pubs/standard/S-100_Index.htm, <http://s100.iho.int/S100/>

HDF5: <https://support.hdfgroup.org/HDF5/>