“The Nation’s Nautical Chartmaker”

Office of Coast Survey
“The Nation’s Nautical Chartmaker”

Office of Coast Survey
“The Nation’s Nautical Chartmaker”

Office of Coast Survey
How Coast Survey builds the National Bathymetry

- **Prepared Source Data**
  - Common Reference Frame
  - Required Metadata

- **Tiled Database**
  - Combined, Tiled, Best Res
  - Common Datum
  - Restricted Source Control

- **Bathymetry Extraction**
  - Format translation
  - Datum transformation
  - Resampling to desired resolution

- **Charting**
- **Precision Navigation**
- **OCS Modeling**
- **COOPS Modeling**
- **NGS Modeling**
- **IOOS Modeling**
- **Federal Agencies**
- **Public**
Workflow: Preprocess
Source Data

- Office of Coast Survey
  - BAG
    - Internal Source Data
    - External Source Data
  - Bathy Point Store
- National Geodetic Survey
  - Lidar
- US Army Corps of Engineers
  - eHydro
Automated Daily eHydro Query

Number of Surveys

216

3 last 60 days
Assumptions

• Hydrographic eye as been applied
  • Data is clean
  • Metadata is correct
• All data is machine readable
  • Open formats
  • Standard formats
Required Metadata

**Datum**
- Vertical
- Horizontal
- Units

**Amalgamation**
- Survey Date
- Quality Score
  - Vertical Uncertainty
  - Horizontal Uncertainty
  - Feature Detection Capability
  - Seafloor Coverage

**Downstream**
- Survey Name
- Authority
- License
Workflow: Ingest

Preprocess → Ingest → Qualify → Amalgamate → Confirm → Disseminate
Datum Transformations

Source Datum -> VDatum -> Working Datum (NAD83 / MLLW) -> VDatum -> Product Datum (NAD83 / ?)
Interpolation
Workflow: Qualify

Preprocess → Ingest → Qualify → Amalgamate → Confirm → Disseminate
Review of input data

• Do we have the right data?
• Is the data what it should be?
• Do we have the metadata?
  • Datum transformation
  • Supersession
Workflow: Amalgamate
Quality Metrics

- Quality metrics – S-101
  - Coverage
  - Uncertainty
  - Feature detection
Change in Quality

• Quality decays with time
  • Events
    • Hurricanes
    • Earthquakes
    • Dredging
  • Sedimentation / erosion
  • Feature “deposition”
Hatteras Inlet is subject to continual change. Entrance buoys are not charted because they are frequently shifted in position.
Workflow: Confirm

Preprocess → Ingest → Qualify → Amalgamate → Confirm → Disseminate
Product Review

• Does this look right?
• Bootstrapping
  • Chart comparison
  • Finding missing source
What is next?

- Continue to build the process
  - Automate
  - Distribution
  - Variable resolution
- Build through New England
- Precision Navigation Ports
  - New York
  - Los Angeles Long Beach
  - Mississippi River
- Continue to engage
  - DOD
  - GMRT / Seabed 2030
  - Other Countries