

Brief Overview of NOS Surface Currents Data Sources and Processing

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Including:

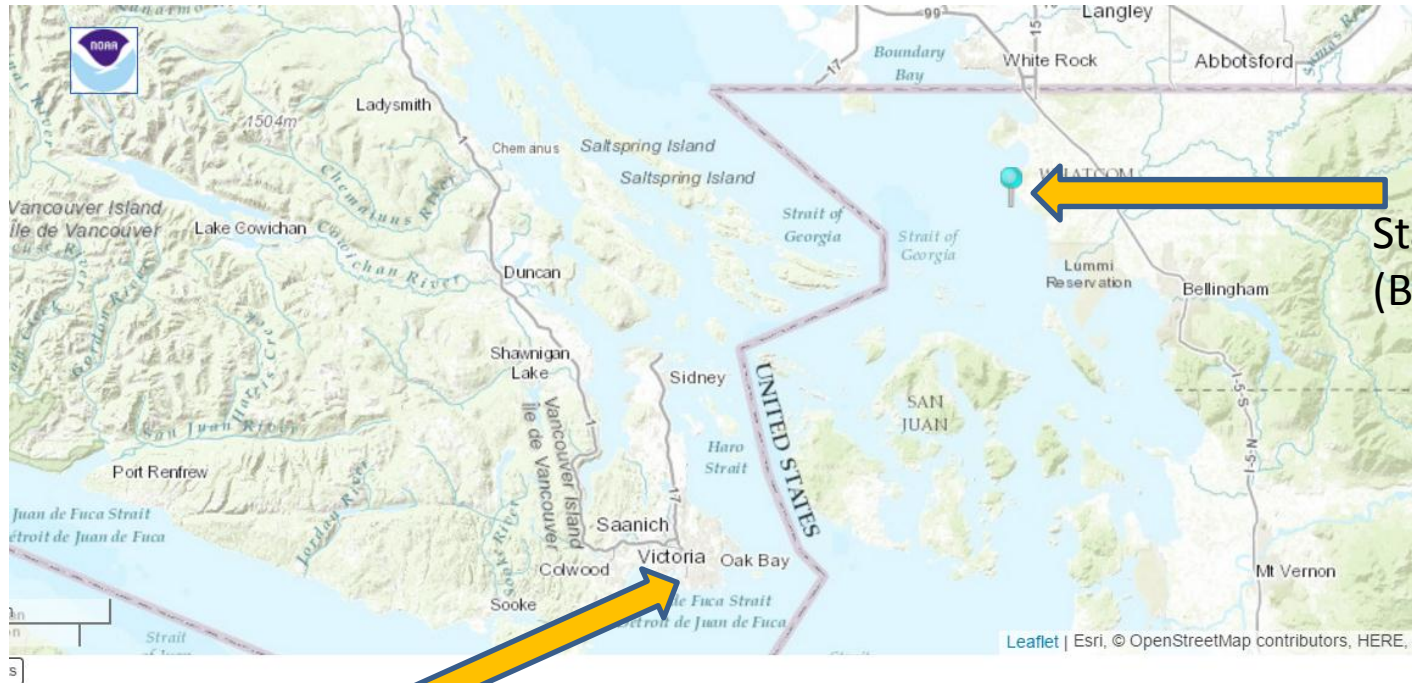
- Real-time and Historical Observations
- Forecast Systems
- Forecast Model Data Processing for S-111

A. NOS Observation Stations for Currents

- **Fixed Station Data**
 - Real time (58 stations)
 - Historical Online (709 stations)
- **Gridded Data**
 - HF radar data (3 sites)

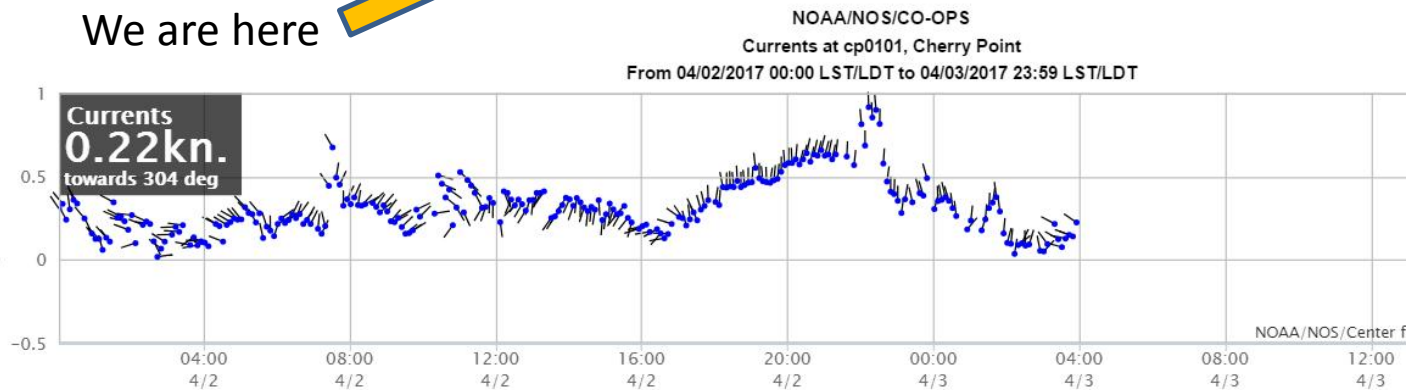
Cherry Point, Wa. - Closest NOS Real Time Obs. Station

Side-looking ADCP, 110 m Range, at Oil Terminal

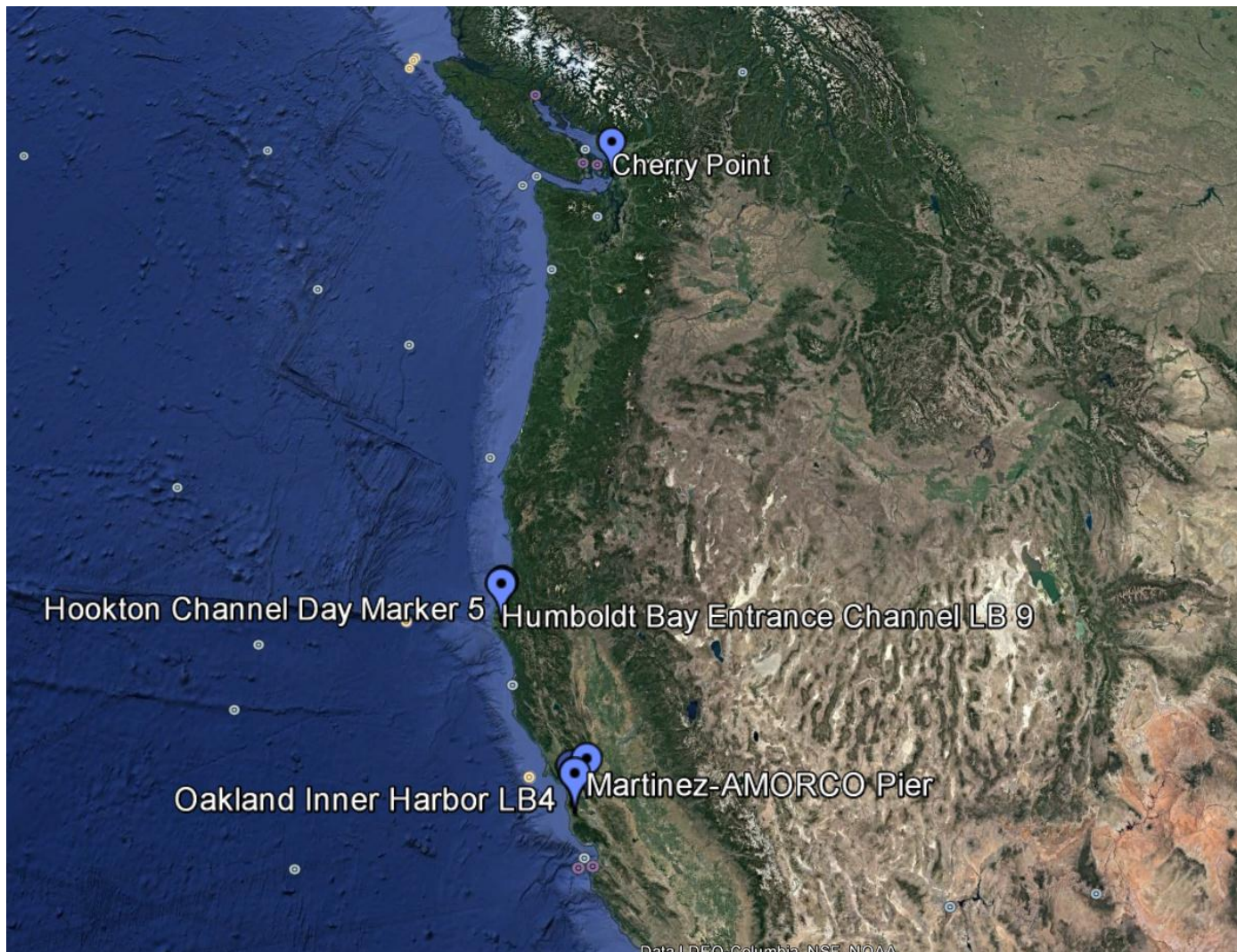


Station
(BP refinery)

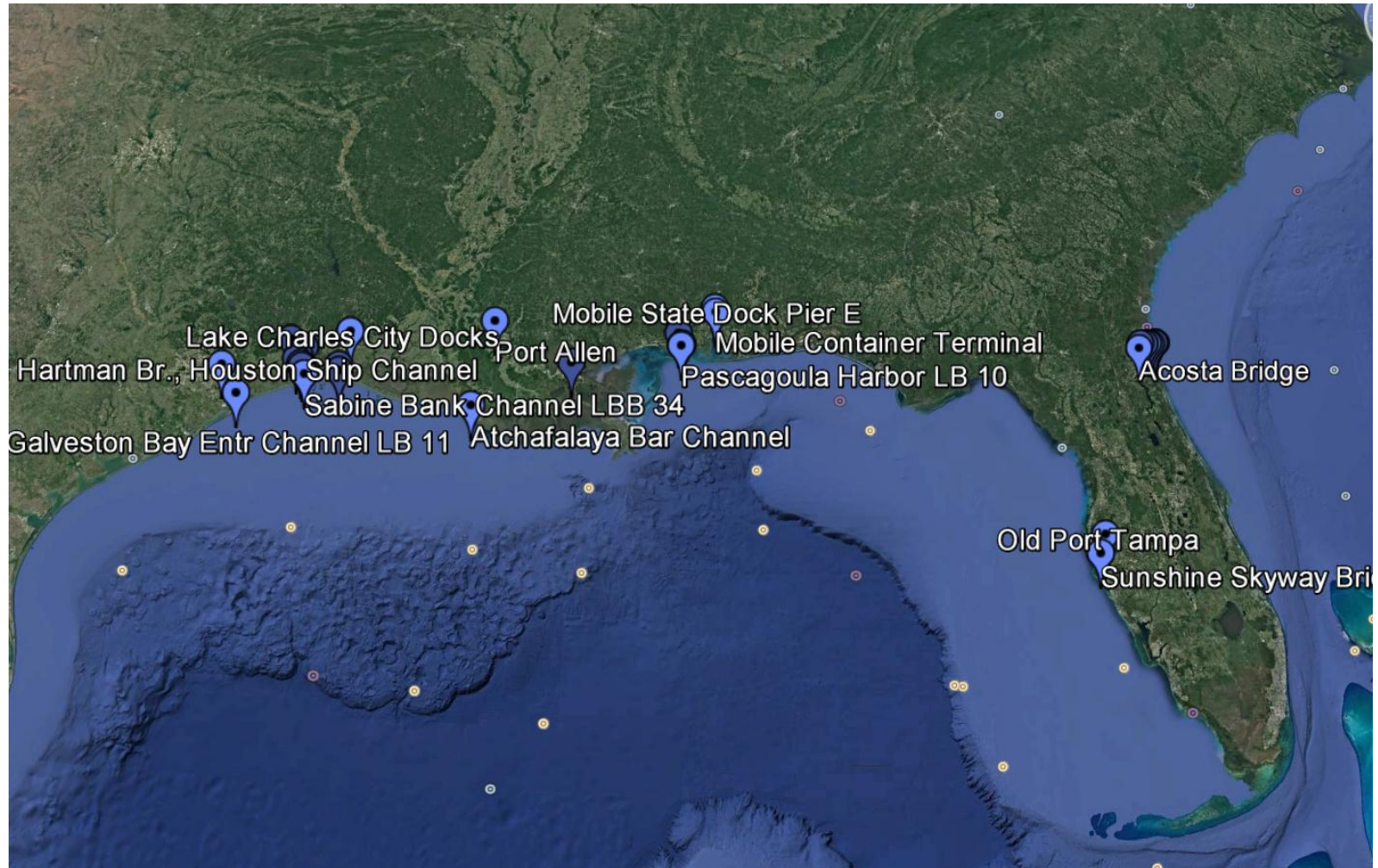
We are here



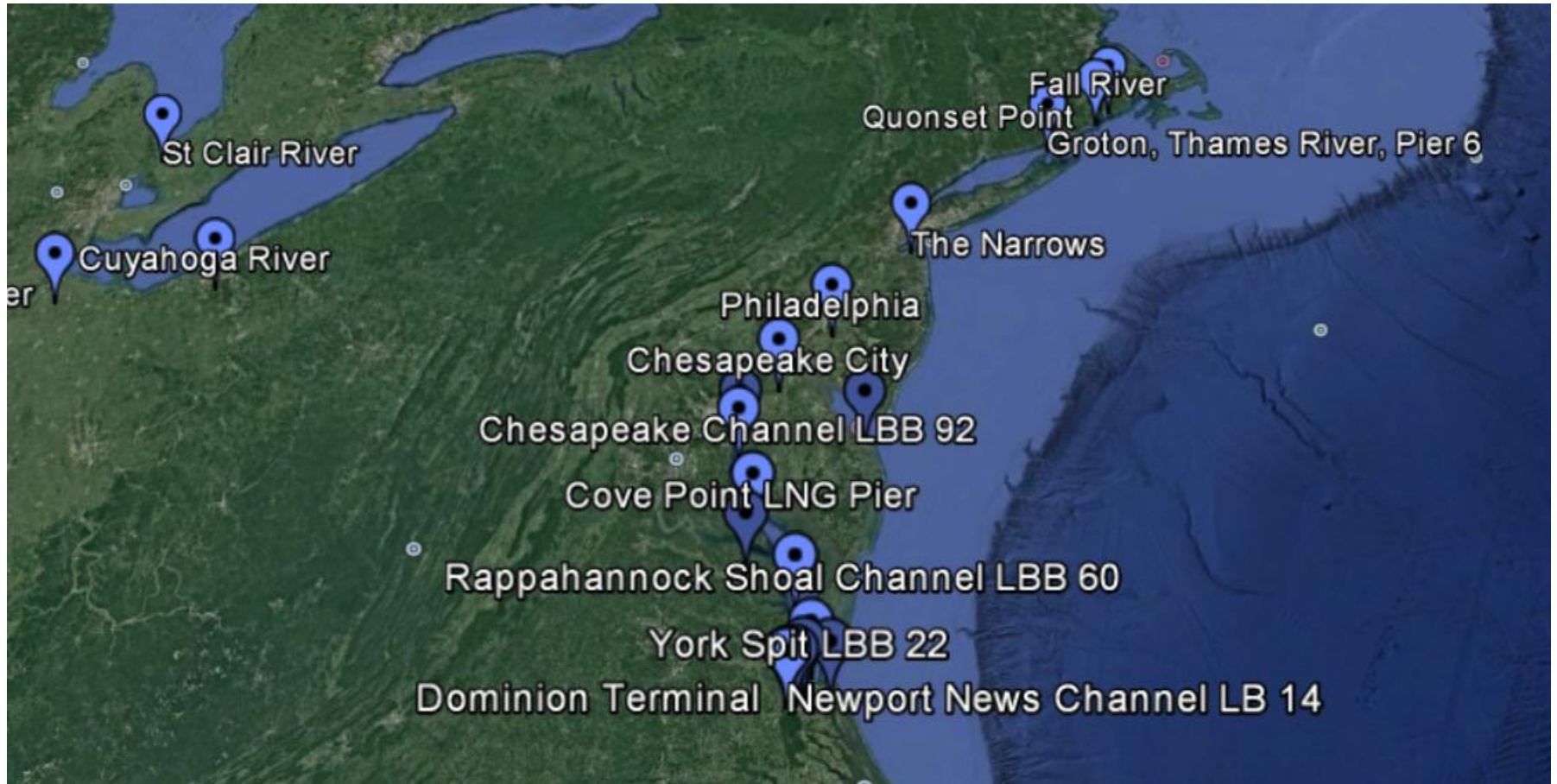
NOS Real Time Systems – Pacific Coast



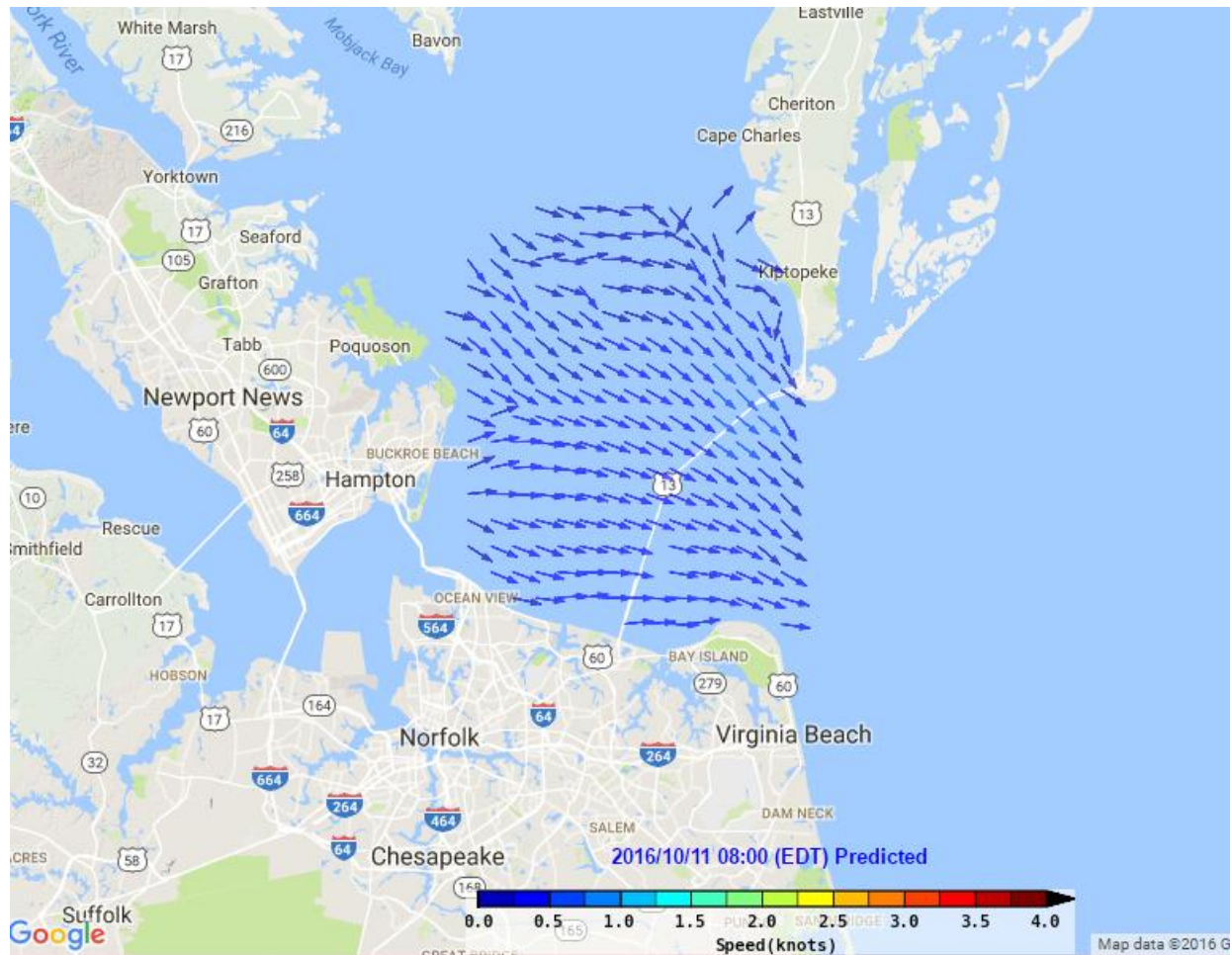
Real Time Systems – Gulf of Mexico and South Atlantic Coasts



Real Time Systems – North Atlantic Coast And US Great Lakes



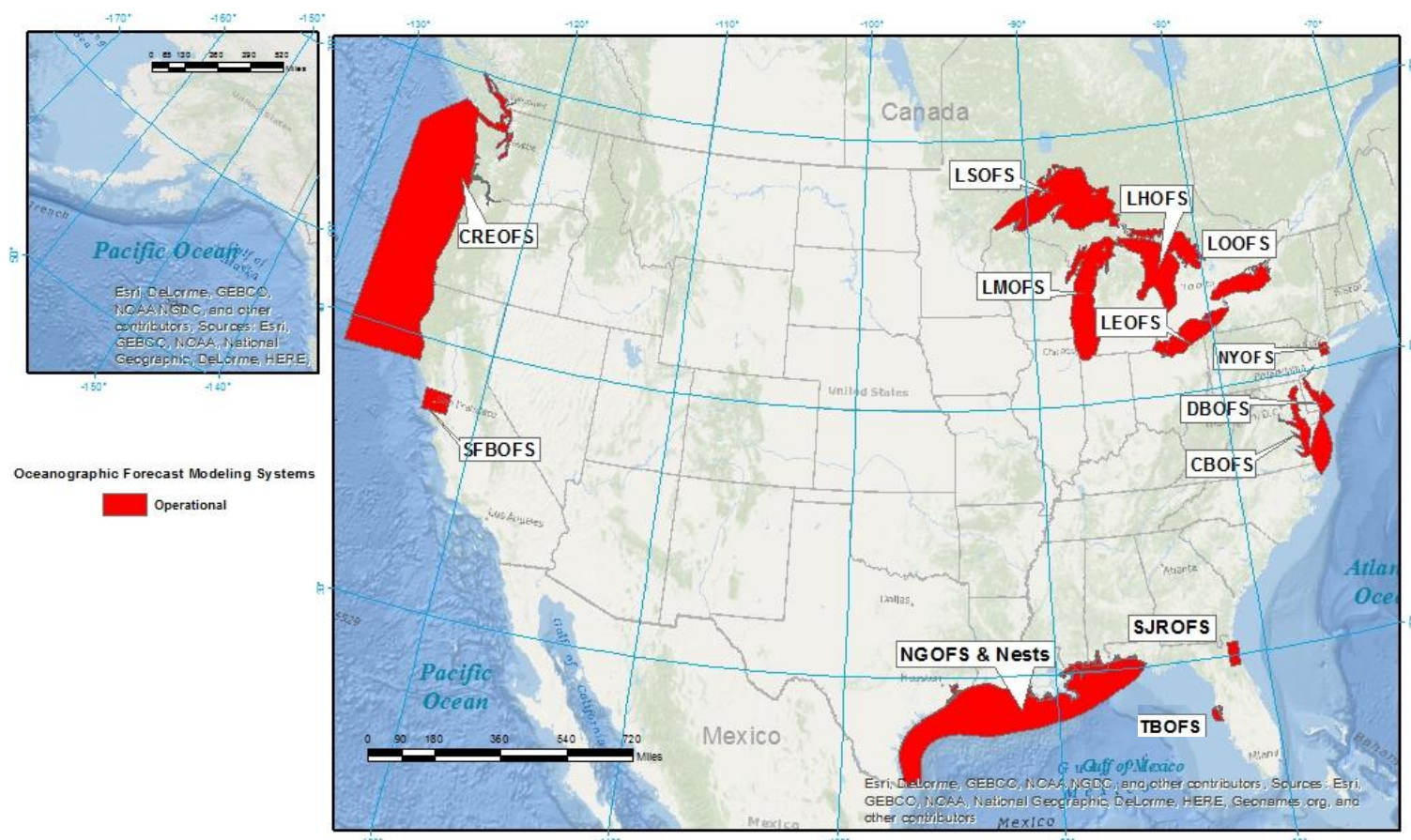
HF Radar Data - Entrance to Chesapeake Bay, Va.



B. NOS Operational Forecast Systems

- **Regular grid forecast systems (5)**
 - Lake Ontario
 - Lake Erie
 - Lake Huron
 - Lake Michigan
 - Lake Superior
- **Irregular grid forecast systems (9)**
 - New York
 - Delaware Bay
 - Chesapeake Bay
 - St Johns River
 - Tampa Bay
 - Northern Gulf of Mexico, NE
 - Northern Gulf of Mexico, NW
 - San Francisco Bay
 - Columbia River

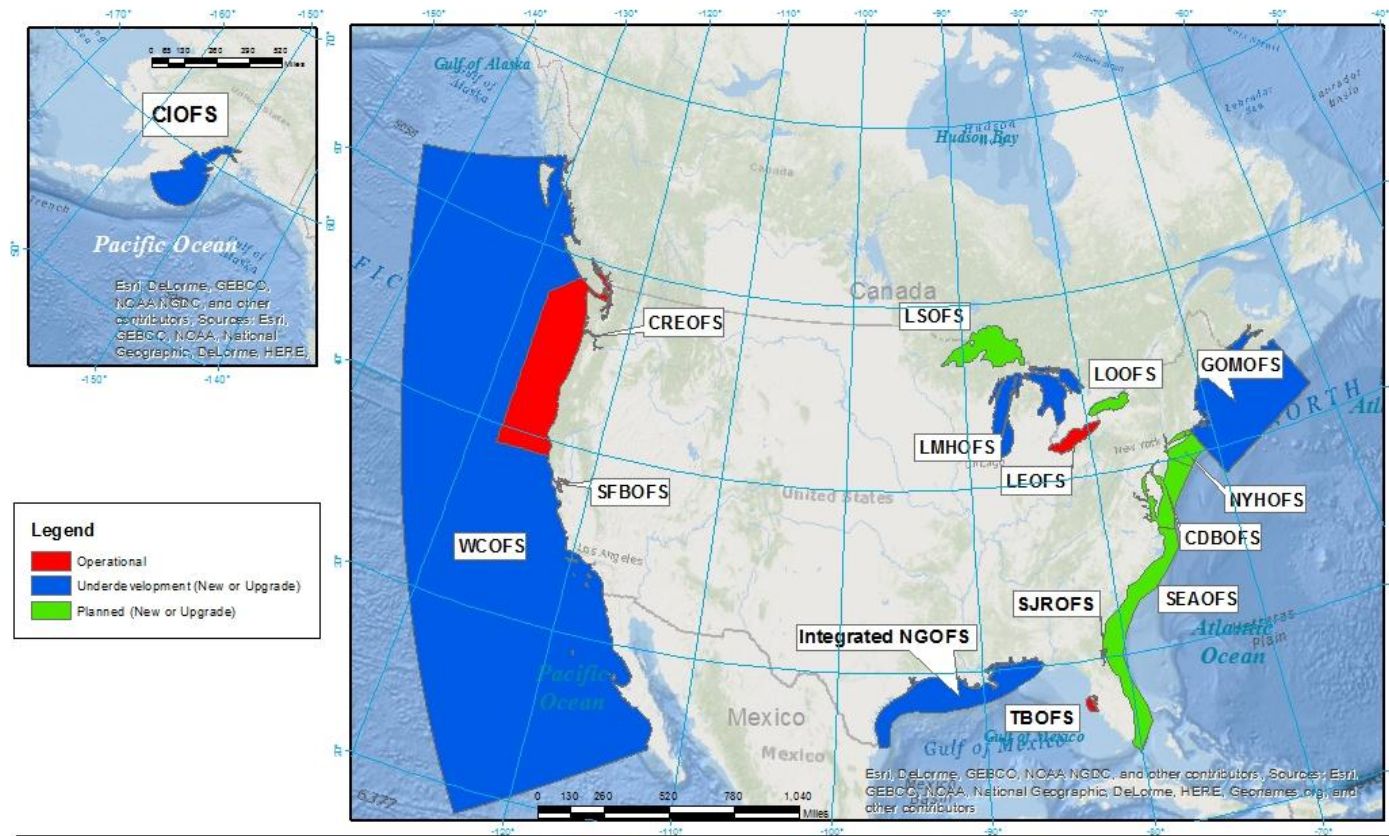
NOS Operational Forecast Systems (Today)



**Current Status of NOAA/National Ocean Service's
Operational Oceanographic Forecast Modeling Systems**

December 31, 2015

Planned Expansion of Fcst Systems



NOTE:

- SJROFS will be decommissioned following implementation of SEAOFs
- NYOFS may be decommissioned following implementation of NYHOPS

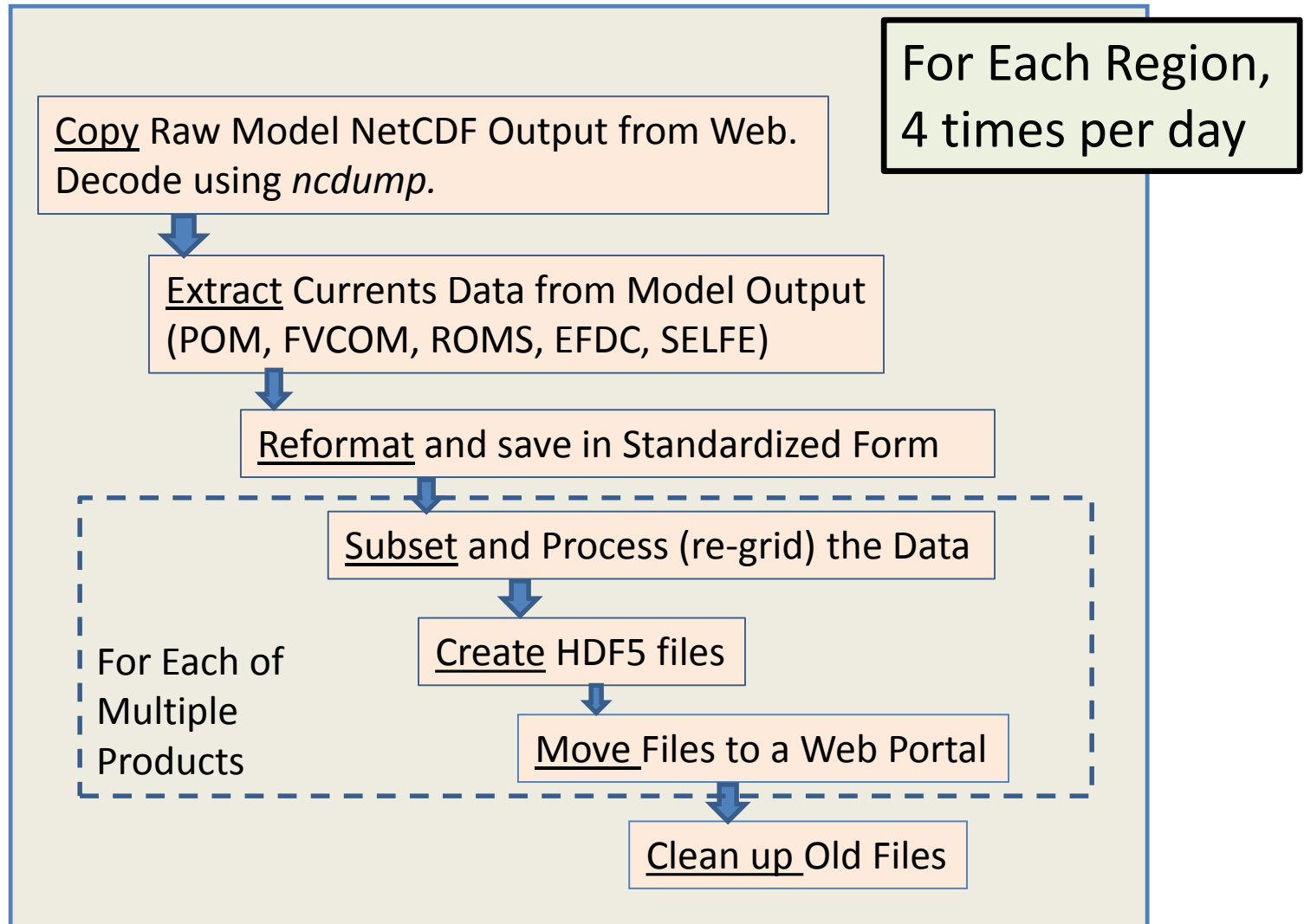
**Plan for NOAA/National Ocean Service's
Operational Oceanographic Forecast Modeling Systems
through FY21**

June 2016

C. Data Processing for NOS Forecast Systems

- **Five Hydrodynamic Model Codes (all 3-D):**
 - Regional Ocean Modeling System (ROMS)
 - Finite Volume Coastal Ocean Model (FVCOM)
 - *Princeton Ocean Model (POM)*
 - *Environmental Fluid Dynamics Code (EFDC)*
 - *Semi-implicit Eulerian-Lagrangian Finite Element Model (SELFE)*
- **Run 4 Times Daily, with at Least 48 Hrly Fcsts**
 - Spatial resolution 50 m up to 5,000 m
- **Model Output is Stored in NetCDF files:**
 - In some, all hours of fcst are in one file
 - In others, each hour of fcst is in a separate file
 - Each model saves a different set of variables

Automated Data Processing Flow for Model Forecast Data (in Development)



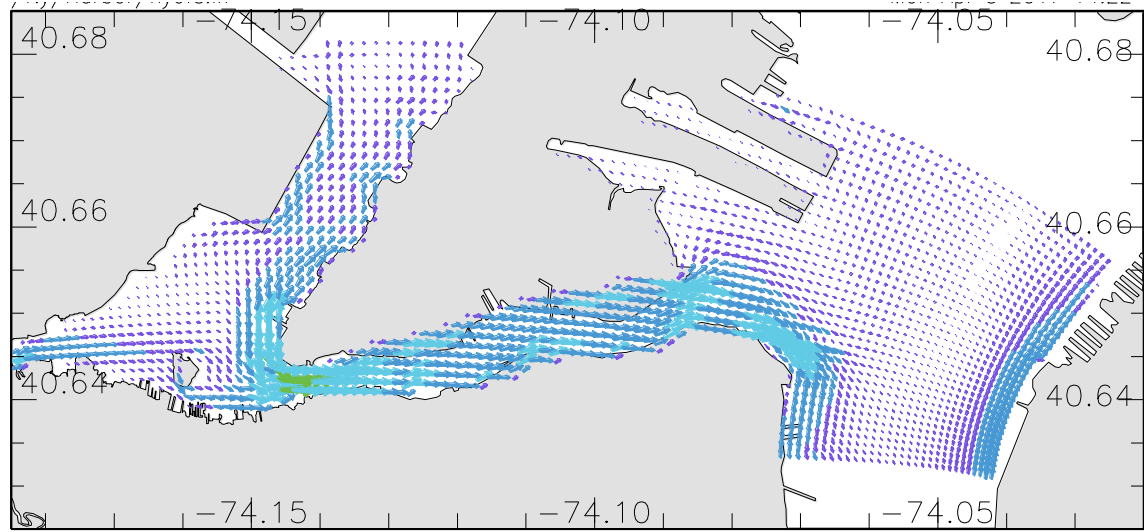
Standardized Output Form

```
20170216 053000 1 0.001521 2210 25 40 =DT,dhr,dm,npts,nsets,model
0.0275 0.0004 0.2630 2.06 -81.723340 30.418530 46 2
0.0400 0.0052 0.2628 1.72 -81.718960 30.418930 46 3
0.0164 0.0001 0.2639 1.60 -81.711840 30.419350 46 4
0.0016 -0.0002 0.2655 1.60 -81.704800 30.419080 46 5
-0.0101 0.0019 0.2672 1.71 -81.698850 30.418330 46 6
-0.0169 0.0028 0.2691 1.85 -81.693380 30.417520 46 7
... ....
```

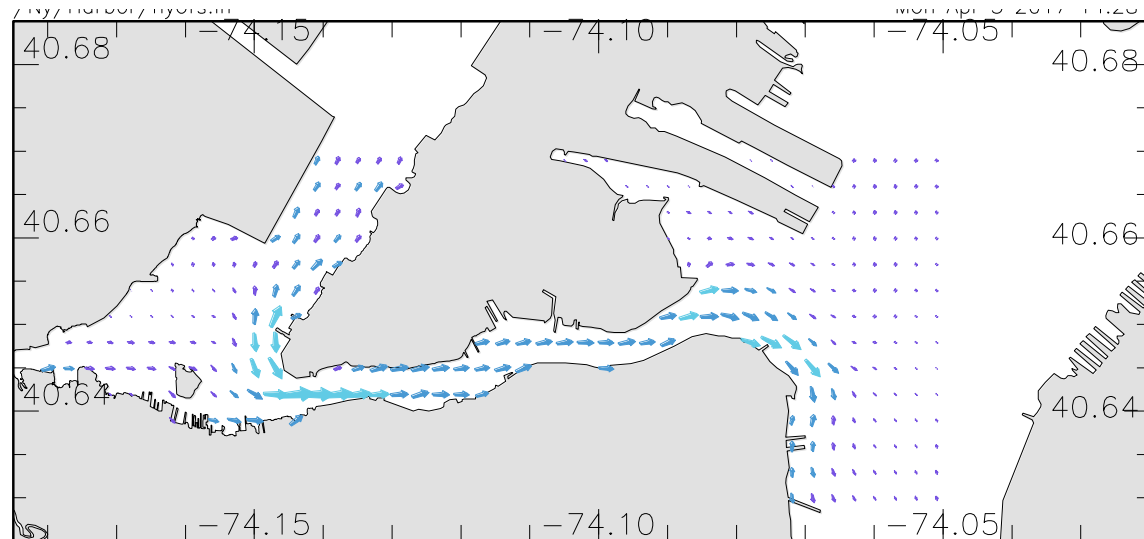
```
20170216 063000 1 0.001521 2210 25 40 =DT,dhr,dm,npts,nsets,model
0.0228 0.0003 0.3285
0.0408 0.0053 0.3279
0.0314 0.0001 0.3273
0.0266 -0.0031 0.3279
0.0296 -0.0056 0.3272
0.0312 -0.0051 0.3262
```

Data Processing: Interpolation to a Regular Grid

Original Data:
Irregular Grid
(2,357 pts)



Processed Data:
Regular Grid,
Smaller Area
(260 pts)



Summary

- NOS is ramping up efforts to create S-111 data files
- Start with copying, reading the forecast model (netCDF) data files
- Examining data repackaging methods
 - Sub-setting (finite element)
 - Interpolation to regular grid
- Automating all procedures
 - Hiring technical support person
- Talking with users to determine what products and geographic areas are of interest
 - Rose Point Navigation Systems (USA)
 - Used on NOAA ships
- In the future, access other data types
 - Real-time observational data
 - HC current predictions
 - NWS data