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Technical Implementation Notice 13-41  
NOAA's National Ocean Service Headquarters Washington DC  
Related by National Weather Service Washington DC  
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From: Peter Stone  
Chief, Oceanographic Division  
NOS Center for Operational Oceanographic Products  
and Services (CO-OPS)

Subject: Implementation of National Ocean Service's new  
Oceanographic Forecast Modeling System for the San  
Francisco Bay, Effective January 28, 2014

Effective January 28, 2014 beginning at 15z Coordinated Universal Time (UTC), 10:00 AM EST, the NOAA/National Ocean Service San Francisco Bay Operational Forecast System (SFBOFS) will be implemented on NOAA's Weather Climate Operational Supercomputing System (WCOSS) operated by NCEP Central Operations (NCO). SFBOFS will now provide users with nowcasts (analyses of near present) and forecast guidance of the three-dimensional physical conditions of the San Francisco Bay, including surface water levels and 3-D water currents, water temperature, and salinity out to 48 hours.

As its core ocean prediction model, SFBOFS uses the Finite Volume Coastal Ocean Model (FVCOM) developed jointly by the University of Massachusetts, Dartmouth, and the Woods Hole Oceanographic Institution. FVCOM is a prognostic, unstructured-grid, finite-volume, free-surface, 3-D primitive equation coastal ocean model. It has a horizontal grid comprised of unstructured triangular cells in which the irregular bottom is presented using generalized terrain-following coordinates.

The SFBOFS grid consists of 54,120 nodes and 102,264 elements and includes the near shelf from Point Reyes (north) to Point San Pedro (south), the entrance of San Francisco Bay, and the complete bay system (Suisin Bay, San Pablo Bay and Central and South Bays). Grid resolution ranges from 39 km near the offshore open ocean boundary to approximately 100 m near the coast, indicating the flexibility of the grid size based on bathymetry from the deep ocean to the coast. Additionally, the higher resolution along the navigational channels within the bays, from

approximately 100 m to 10 m, provides detailed current features.

SFBOFS operates within the NOS Coastal Ocean Modeling Framework (COMF) and has four daily nowcast and forecast cycles at 03, 09, 15 and 21 UTC.

For the SFBOFS nowcast cycle, the meteorological forcing is provided by the nested, high resolution (4 km) NCEP North American Mesoscale (NAM) weather prediction model. River discharge and stage are estimated using near real-time observations from U.S. Geological Survey river gauges. Oceanographic conditions of subtidal water levels, water temperature and salinity on the SFBOFS lateral open boundary on the shelf are estimated based on forecast guidance from the Global Real-Time Ocean Forecast System (G-RTOFS) and adjusted by real-time observations at NOS water level gauges. Tides are derived from a regional tidal model of the northeast Pacific Ocean developed by Dr. Mike Foreman. The Navy's Hybrid Coordinate Ocean Model (HYCOM) and the NWS Extra-Tropical Storm Surge (ETSS) Model are used as a backup if G-RTOFS is not available.

For the SFBOFS forecast cycle, the meteorological forcing is provided by the nested, high resolution (4 km) NCEP North American Mesoscale (NAM) weather prediction model. River discharge and stage are estimated by persistence of the most recent near real-time observations from U.S. Geological Survey river gauges. Oceanographic conditions of subtidal water levels, water temperature and salinity on the SFBOFS lateral open boundary on the shelf are estimated based on forecast guidance from G-RTOFS. Tides are derived from Dr. Foreman's northeast Pacific Ocean tidal model. The Navy's HYCOM and the NWS Extra-Tropical Storm Surge (ETSS) Model are used as a backup if G-RTOFS is not available.

Gridded and point forecast guidance from SFBOFS will be available in netCDF files on the NCEP server at NOAA's Web Operations Centers (WOC) (<ftpprd.ncep.noaa.gov>) in the directory

</pub/data/nccfs/com/nos/prod/sfbofs.yyyymmdd>

at NOS/CO-OPS OPeNDAP server

<http://opendap.co-ops.nos.noaa.gov/netcdf/>

and at CO-OPS THREDDS server

<http://opendap.co-ops.nos.noaa.gov/thredds/catalog.html>

SFBOFS output is displayed on the CO-OPS web page at

<http://tidesandcurrents.noaa.gov>

Additional information about SFBOFS can be found at

<http://www.tidesandcurrents.noaa.gov/models.html>

SFBOFS predictions are used by commercial and recreational mariners and fishermen, emergency managers, search and rescue operations, and NWS marine weather forecasters. The development and implementation of SFBOFS was a joint project of the NOS/Office of Coast Survey (OCS), the NOS/Center for Operational Oceanographic Products and Services (CO-OPS), NWS/NCEP/NCO, the University of Massachusetts, Dartmouth, and the Woods Hole Oceanographic Institution. SFBOFS is monitored 24x7 by both NCO/NCEP and CO-OPS Continuous Real-Time Monitoring System (CORMS) personnel.

If you have any questions concerning these changes, contact:

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For questions regarding the dataflow aspects with respect to the NCEP server at the WOC, please contact:

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NCEP/NCO Dataflow Team  
College Park, MD  
Email: [ncep.list.pmb-dataflow@noaa.gov](mailto:ncep.list.pmb-dataflow@noaa.gov)

For questions on how to access SFBOFS digital products from CO-OPS servers please contact:

NOS/CO-OPS/User Services Team  
Silver Spring, MD  
Email: [tide.prediction@noaa.gov](mailto:tide.prediction@noaa.gov)

NWS National Technical Implementation Notices are online at:

<http://www.nws.noaa.gov/os/notif.htm>

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