

NOUS41 KWBC 052100
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Technical Implementation Notice 12-02
NOAA's National Ocean Service Headquarters Washington DC
Relayed by National Weather Service Headquarters Washington DC
400 PM EST Thu Jan 5 2011

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From: Peter Stone
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 NOS Center for Operational Oceanographic Products and
 Services (CO-OPS)

Subject: Implementation of National Ocean Service's New Oceanographic
Forecast Modeling System for Northern Gulf of Mexico: Effective March 29,
2012

Effective March 29, 2012 beginning at 1500 Coordinated Universal Time (UTC), 10:00 AM Eastern Standard Time (EST), the National Ocean Service (NOS) Northern Gulf of Mexico Operational Forecast System (NGOFS) will be implemented on NOAA's Central Computer System (CCS) operated by the National Centers for Environmental Prediction (NCEP) Central Operations (NCO). NGOFS will now provide users with nowcasts (analyses of near present) and forecast guidance of the three-dimensional (3-D) physical conditions of the northern Gulf of Mexico. The nowcasts will include surface water levels and 3-D water currents, water temperature, and salinity out to 48 hours.

As its core ocean prediction model, NGOFS 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 with a horizontal grid comprised of unstructured triangular cells in which the irregular bottom is presented using generalized terrain-following coordinates.

The NGOFS grid consists of 91,652 nodes and 176,545 elements. The grid includes northern Gulf of Mexico shelf waters and bays. Grid resolution ranges from 10 km on the open ocean boundary to approximately 600 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 bays, from approximately 200 m to 300 m, provides detailed current features.

NGOFS operates within the NOS Coastal Ocean Modeling Framework (COMF) and has four daily nowcast and forecast cycles at 0, 6, 12, and 18 UTC.

For the NGOFS nowcast cycle, the meteorological forcing is provided by the nested, high-resolution (four km) NCEP North American Mesoscale (NAM) weather prediction model.

River discharge is estimated using near-real-time observations from U.S. Geological Survey river gauges.

Oceanographic conditions of subtidal water levels, currents, water temperature and salinity on the NGOFS lateral open boundary on the shelf are estimated based on forecast guidance from the Navy Coast Ocean Model (NCOM) and adjusted by real-time observations at NOS water level gauges.

Tides are derived from the Advanced CIRCulation Model (ADCIRC) ec2001 tide database. Subtidal water level forecasts from NWS Extra-Tropical Storm Surge (ETSS) Model are used as a backup if NCOM is not available.

For the NGOFS forecast cycle, the meteorological forcing is provided by the nested, high resolution (4 km) NCEP North American Mesoscale (NAM) weather prediction model.

River discharge is estimated by persistence of the most recent near-real-time observations from U.S. Geological Survey river gauges.

Oceanographic conditions of subtidal water levels, currents, water temperature and salinity on NGOFS' lateral open boundary on the shelf are estimated based on forecast guidance from NCOM.

Tides are derived from the ADCIRC ec2001 tide database. Subtidal water level forecasts from NWS ETSS Model are used as a backup if NCOM is not available.

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

`/pub/data/nccfs/com/nos/prod/ngofs.yyyyymmdd`

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>

NGOFS output is displayed on the CO-OPS webpage at:

<http://tidesandcurrents.noaa.gov>

Additional information about NGOFS can be found at:

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

NGOFS 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 NGOFS 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 and the University of Massachusetts, Dartmouth. NGOFS is monitored 24 x 7 by both NCO and CO-OPS Continuous Real-Time Monitoring System (CORMS) personnel.

If you have any questions concerning these changes, please 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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For questions on how to access NGOFS digital products from CO-OPS servers, please contact:

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National Technical Implementation Notices are online at:

<https://www.weather.gov/notification/archive>

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