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Technical Implementation Notice 12-43  
NOAA's National Ocean Service Headquarters Washington DC  
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From:         Frank Aikman  
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              NOS Office of Coast Survey

Subject: Implementation of New Extratropical Surge and Tide Operational Forecast System (ESTOFS) for the Atlantic and Gulf Coasts: Effective September 18, 2012

Effective September 18, 2012, beginning at 1200 Coordinated Universal Time (UTC), 800 AM Eastern Daylight Time (EDT), the Extratropical Surge and Tide Operational Forecast System for the Atlantic (ESTOFS Atlantic) will be implemented on NOAA's Central Computer System (CCS) operated by the National Centers for Environmental Prediction (NCEP) Central Operations (NCO). ESTOFS Atlantic will provide users with nowcasts (analyses of near present conditions) and forecast guidance of water level conditions for the Atlantic and Gulf coasts. The forecast outputs will include water levels caused by the combined effects of storm surge and tides, by astronomical tides alone, and by sub-tidal water levels (isolated storm surge), out to 180 hours.

The hydrodynamic model employed by ESTOFS is the ADvanced CIRCulation (ADCIRC) finite element model. ADCIRC was developed to perform high-resolution simulations of time-dependent, free surface circulation and transport problems in two and three dimensions. ESTOFS uses the Two-Dimensional Depth Integrated (2DDI) version of ADCIRC, which computes the water surface elevation and barotropic depth-averaged currents. ADCIRC uses the finite element method in space, taking advantage of highly flexible, irregularly spaced grids.

The unstructured grid used by ESTOFS Atlantic consists of 254,565 nodes and 492,179 triangular elements. Coastal resolution generally averages about 3 km. The open-ocean boundary is located at the 60 degrees W meridian, where harmonic tidal constituents from the global tidal model TPXO 6.2 are used to specify tidal water surface fluctuations, while tidal potential forcing is applied within the interior of the domain. The performance of this grid for astronomical tides was verified using tidal elevation data from observation stations located throughout the domain.

ESTOFS is designed to provide water surface elevations caused by storm surge and astronomical tide to the NCEP WAVEWATCH III (WW3) wave model for coupling wave and water level predictions. Therefore, ESTOFS' setup is designed to mimic WW3: it uses the same Global Forecast System (GFS) atmospheric forcing (ESTOFS applies 10 m wind speeds and sea level pressure from GFS), has the same forecast cycle (four times per day concurrent with GFS), length (6-hour nowcast followed by a 180-hour forecast), and both will run concurrently on the CCS.

ESTOFS output files are provided in two formats: structured gridded binary version 2 (GRIB2) files for the contiguous U.S. (CONUS; 2.5 km resolution) and for Puerto Rico (1.25 km resolution) grids, and unstructured NetCDF files on the native ESTOFS finite element grid. NetCDF output is also provided at station locations. GRIB2 files are created for each hourly prediction during a forecast cycle, consisting of records of combined water level (surge with tide), harmonic tidal prediction (astronomical tides), and sub-tidal water levels (the isolated surge). NetCDF files contain an entire nowcast/forecast cycle, and consist of the hourly combined water level over the native ESTOFS grid, or six-minute combined water level records at station locations.

Beginning September 18, 2012 at 1200 UTC, operational forecast guidance from ESTOFS Atlantic will be available in the netCDF and GRIB2 files described above via the NCEP server at NOAA's Web Operations Centers (WOC) in the directory:

<http://www.ftp.ncep.noaa.gov/data/nccf/com/estofs/prod>  
<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/estofs/prod>

Operational ESTOFS GRIB2 output will also be disseminated via NCEP's NOAA Operational Model Archive and Distribution System (NOMADS) server at:

<http://nomads.ncep.noaa.gov/>

ESTOFS is monitored 24 x 7 by NCO. ESTOFS output is not currently available via the Satellite Broadcast Network (SBN) or within the Advanced Weather Interactive Processing System (AWIPS) at this time.

For 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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