NOUS41 KWBC 191630
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Technical Implementation Notice 14-27
NOAA's National Ocean Service Headquarters Washington DC
Relayed by National Weather Service Headquarters Washington DC
1230 PM EDT Thu Jun 19 2014

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From: Frank Aikman, Chief
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         NOS Office of Coast Survey

Subject: Implementation of New Extratropical Surge and Tide Operational
Forecast System for the Pacific (ESTOFS Pacific) for the West Coast, Gulf
of Alaska, and Hawaii: Effective June 24, 2014

Effective June 24, 2014, beginning at 1200 Coordinated Universal Time
(UTC), 800 AM Eastern Daylight Time (EDT), ESTOFS Pacific will be
implemented on the NOAA Weather and Climate Operational Supercomputing
System (WCOSS) operated by the National Centers for Environmental
Prediction (NCEP) Central Operations (NCO). ESTOFS Pacific will provide
users with nowcasts (analyses of near present conditions) and forecast
guidance of water level conditions for the West Coast, Gulf of Alaska, and
Hawaii. 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 Pacific consists of 132,630 nodes and
256,314 triangular elements. Coastal resolution generally ranges between
one and three km. Harmonic tidal constituents from the global tidal model
TPXO8-ATLAS are used to specify tidal water surface fluctuations at the
open ocean boundary, 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 Pacific 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, the
ESTOFS set-up 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 will run concurrently on the WCOSS.

ESTOFS output files are provided in two formats: structured gridded binary
version two (GRIB2) files for the contiguous United States (CONUS; 2.5 km
resolution) and for Alaska (six km resolution) and Hawaii (2.5 km
resolution), 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 6-minute combined water level records at station locations.

Beginning June 24, 2014 at 1200 UTC, operational forecast guidance from
ESTOFS Pacific will be available in the netCDF and GRIB2 files described
above via the NCEP server at:

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 Pacific 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 Web Operation Center (WOC), please contact:

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National Technical Implementation Notices are online at:

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

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