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PNSWSH

Service Change Notice 20-89 Updated
National Weather Service Headquarters Silver Spring MD
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To: Subscribers:
           -NOAA Weather Wire Service
           -Emergency Managers Weather Information Network
           -NOAAPort
           -Other NWS Partners, Users and Employees

From: Brian Gross
           Acting Director, National Centers for Environmental Prediction

Subject: Updated: Implementation of the Extratropical Surge and Tide
Operational Forecast System Global (ESTOFS-Global): Effective November 24,
2020

Updated to reflect new implementation date.

Effective on or about November 24, 2020, beginning with the 1200
Coordinated Universal Time (UTC) cycle, the National Centers for
Environmental Prediction (NCEP) Central Operations (NCO) will upgrade the
Extratropical Surge and Tide Operational Forecast System (ESTOFS) to
ESTOFS Global (ESTOFS-Global).

The new upgrade will replace and retire all three current operational
ESTOFS models: ESTOFS-Atlantic, ESTOFS-Pacific and ESTOFS-Micronesia. The
new ESTOFS-Global will provide global coverage that will extend model
coverage of the existing ESTOFS models.

Expected benefits from this upgrade include:
 -Improved spatial resolution in U.S. waters
 -Unification of ESTOFS modeling infrastructure
 -Reduction of bias and errors due to removal of the open ocean boundary
 -Inclusion of internal tides
 -Inclusion of self-attraction and loading
 -Inclusion of sea-ice effect on wind drag coefficient
 -Implementation of dynamic water level bias correction.

1) Implementation of dynamic water level bias correction effect

Observed coastal water level anomalies are assimilated to reduce linear
bias. This model bias is associated with unresolved physical processes
(river outflow, wave setup, seasonal baroclinic variability, mesoscale
circulation, poorly resolved weather signals, etc.). A 2-day average of
the water level anomalies is used, which has been found to be the best
representation of setup/setdown state for the model. These anomalies are
defined as the observed water level minus the tidal prediction, so only
the surge is corrected using this offset since we are assuming the tides
are perfectly represented. The offsets are computed each cycle (every six
hours) at observation locations and interpolated across the model grid

using Shepard's Inverse Distance Weighted (IDW) method. The offsets are computed before the nowcast and persisted as a constant offset during the nowcast and forecast.

2) Output changes for web services

With this upgrade, the following changes will be noted on NCEP web services:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/
ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/

A. Directory Changes:
From - estofs/prod/estofs_atl.YYYYMMDD
       estofs/prod/estofs_mic.YYYYMMDD
       estofs/prod/estofs_pac.YYYYMMDD

To -   estofs/prod/estofs.YYYYMMDD
Where YYYYMMDD is year, month and day.

B. NOMADS Grib Filter Changes:
From: https://nomads.ncep.noaa.gov/cgi-bin/filter_estofs_atl.pl
       https://nomads.ncep.noaa.gov/cgi-bin/filter_estofs_pac.pl
       https://nomads.ncep.noaa.gov/cgi-bin/filter_estofs_mic.pl

To -   https://nomads.ncep.noaa.gov/cgi-bin/filter_estofs.pl

C. OpenDAP Changes:
From - https://nomads.ncep.noaa.gov/dods/estofs_atl
       https://nomads.ncep.noaa.gov/dods/estofs_pac
       https://nomads.ncep.noaa.gov/dods/estofs_mic

To -   https://nomads.ncep.noaa.gov/dods/estofs

D. Timeliness changes:
ESTOFS-Global files may be up to 40 minutes later relative to the current production output times of ESTOFS-Atlantic and ESTOFS-Micronesia files. Files currently in the ESTOFS-Pacific production directory may be up to 1:40 later.

E. Resolution changes:
The increased unstructured grid consists of 8 million nodes, which increases coastal grid resolution to up to 80 m for Hawaii and U.S. West Coast and to up to 120 m for U.S. East Coast, Puerto Rico, Micronesia, and Alaska. The grid extends inland up to six m above Mean Sea Level (MSL) for the U.S. East Coast, and up to 20 m above MSL for the Pacific Islands.

F. Filename changes and additions of fields files:
The increased resolution will impact the following field files. Some files will change name, while others will be new.

From - estofs.{atl,pac,mic}.tCCz.fields.cwl.nc

To -   estofs.tCCz.fields.cwl.nc

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New -  estofs.tCCz.fields.htp.nc
       estofs.tCCz.fields.swl.nc
Where tCCz is forecast cycle: CC = 00, 06, 12, 18; cwl = combined water
level, htp = tidal predictions, swl = surge-only component.


G.  Filename changes and additions of point output:
ESTOFS-Global will produce point output at 558 locations globally.  These
point locations will be provided in the following files:
From - estofs.{atl,pac,mic}.tCCz.points.cwl.nc
       estofs.{atl,pac,mic}.tCCz.points.htp.nc


To -   estofs.tCCz.points.cwl.nc
       estofs.tCCz.points.htp.nc


New -  estofs.tCCz.points.swl.nc
Where tCCz is forecast cycle: CC = 00, 06, 12, 18; cwl = combined water
level, htp = tidal predictions, swl = surge-only component.


H. Filename changes and additions of gridded binary version two (GRIB2)
output:
GRIB2 contiguous U.S. (CONUS) filenames will change, providing U.S. East
Coast and West Coast regions separately:


From - estofs.{atl,pac}.tCCz.conus.fHHH.grib2


To -   estofs.tCCz.conus.{east,west}.fHHH.grib2
Where fHHH is forecast hour: HHH=000 through HHH=180.


GRIB2 filenames for all regions will change:
From - estofs.atl.tCCz.puertori.fHHH.grib2
       estofs.pac.tCCz.alaska.fHHH.grib2
       estofs.pac.tCCz.hawaii.fHHH.grib2
       estofs.mic.tCCz.guam.{fHHH,cwl,htp,swl}.grib2
       estofs.mic.tCCz.northpacific.{fHHH,cwl,htp,swl}.grib2


To -   estofs.tCCz.puertori.fHHH.grib2
       estofs.tCCz.alaska.fHHH.grib2
       estofs.tCCz.hawaii.fHHH.grib2
       estofs.tCCz.guam.fHHH.grib2
       estofs.tCCz.northpacific.fHHH.grib2
Where tCCz is forecast cycle: CC = 00, 06, 12, 18; fHHH is forecast hour:
HHH = 000, 001, 002, ... 180; cwl = combined water level, htp = tidal
predictions, swl = surge-only component.


I.  Filename changes and additions of Standard Hydrometeorological
Exchange Format (SHEF) output:
SHEF files will change names and include entire U.S. coastal stations
including Puerto Rico, Hawaii, Micronesia and Alaska:


From - estofs.{atl,mic}.tCCz.points.cwl.shef
       estofs.{atl,mic}.tCCz.points.htp.shef
       estofs.{atl,mic}.tCCz.points.swl.shef


To -   estofs.tCCz.points.cwl.shef
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```
        estofs.tCCz.points.htp.shef
        estofs.tCCz.points.swl.shef
Where tCCz is forecast cycle: CC = 00, 06, 12, 18; cwl = combined water
level, htp = tidal predictions, swl = surge-only component.
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3) NOAAPort/Satellite Broadcast Network (SBN) Changes

1. Timing changes:
There are timeliness changes up to 60 minutes later for Atlantic and
Micronesia data and 80 minutes for Pacific data distributed over NOAAPort.

2. Update to SHEF ID impacting headers:
Users who are using the Micronesia SHEF IDs labeled "TIBEM" will need to
begin using the Atlantic SHEF IDs labeled "TIBEA."

Product	Old Header	New Header
SHEF Harmonic Tidal Prediction	SXUS01 KWBM TIBEM	SXUS01 KWBM TIBEA
SHEF Combined Water Level	SXUS02 KWBM TIBEM	SXUS02 KWBM TIBEA
SHEF Sub-tidal Water Levels	SXUS03 KWBM TIBEM	SXUS03 KWBM TIBEA

The Ocean Prediction Center (OPC) of NWS will deliver graphics of the
model outputs on the following site:

https://ocean.weather.gov/estofs/estofs_surge_info.php

NOAA's nowCOAST (https://nowcoast.noaa.gov) will be upgraded to provide
maps of water level forecast guidance from the latest ESTOFS-Global
forecast cycle, as well as geo-referenced hyperlinks to point forecast
guidance time series plots, via the nowCOAST map viewer and the map
service at:

https://nowcoast.noaa.gov/arcgis/rest/services/nowcoast/guidance_model_coa
stalocean_estofs_time/MapServer

Displayed coverage will be limited, however, to approximately the same
geographic areas as the previous ESTOFS grid domains (Northwest Atlantic,
Gulf of Mexico, Puerto Rico, Northeast Pacific, Hawaii and Micronesia).
Maps of forecast guidance for the entire ESTOFS-Global coverage area will
be made available in a future nowCOAST upgrade.

A consistent parallel feed of data is available on the NCEP HTTPS site at
the following URL:

https://para.nomads.ncep.noaa.gov/pub/data/nccf/com/estofs/para

NCEP urges all users to ensure their decoders can handle changes in
content order, changes in the scaling factor component within the product
definition section (PDS) of the GRIB files, and volume changes. These
elements may change with future NCEP model implementations. NCEP will
make every attempt to alert users to these changes before implementation.

Any questions, comments or requests regarding this implementation should
be directed to the contacts below.

For questions concerning science changes, please contact:

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For questions regarding the data flow aspects of these datasets, contact:

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National Service Change Notices are online at:

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

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