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Service Change Notice 17-63 Updated
National Weather Service Headquarters Silver Spring MD
350 PM EST Mon Nov 6 2017

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From: Dave Myrick
 NWS Office of Science and Technology Integration

Subject: Updated: Extra-Tropical Storm Surge (ETSS) Model Upgrade and the
First Version of Probabilistic Extra-Tropical Storm Surge (P-ETSS) Model:
Effective December 6, 2017

Updated to change scheduled implementation date to December 6, 2017 from
to be determined (TBD).

On or about December 6, 2017, beginning with the 1200 Coordinated
Universal Time (UTC) cycle, the Extra-Tropical Storm Surge (ETSS) model
will be upgraded to:

- Create a single basin with overland information that covers the Gulf of Alaska and the West Coast.
- Create a new Tide version to resolve a tidal phase shift in the Cedar Key (CD2), Tampa Bay (ETP3) and Apalachicola Bay (AP3) Sea Lake and Overland Surges from Hurricanes (SLOSH) basins.
- Remove a wiggle seen in the station guidance from ETSS V2.1.
- Experimentally generate a maximum storm tide above the North American Vertical Datum of 1988 (NAVD-88) over the next 102 hours product.
- Extend the guidance from 96 to 102 hours.
- Discontinue the dissemination of the 5.0 km contiguous U.S. (CONUS) and 6.0 km Alaska grids.
- General Enhancements / Bug fixes (e.g., make the CSV files self-describing, add comments to the Standard Hydrologic Exchange Format (SHEF) output and correct the linear interpolation methods in the post-processing codes).

Also, on implementation day, the first version of Probabilistic Extra-Tropical Storm Surge (P-ETSS) will be released. It will:

- Run ETSS 2.2 with the 0.5 degree wind and pressure fields from the Global Ensemble Forecast System's (GEFS') 21 members.
- Equally weight the results to generate the probability.
- Create products as detailed in the new P-ETSS products section below:

The following ETSS products are available on the National Centers for Environmental Prediction (NCEP) dissemination sites:

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

or the NWS National Digital Gridded Database (NDGD) dissemination sites:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.slosh/AR.conus/>
<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.slosh/AR.alaska/>
<http://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.slosh/AR.conus/>
<http://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.slosh/AR.alaska/>

New ETSS Products:

Generation of new maximum storm tide above NAVD-88 over the next 102 hours products on NCEP servers:

etss.tHHz.max.stormtide.con2p5km.grib2 for 2.5 km CONUS grid
etss.tHHz.max.stormtide.con625m.grib2 for 625 m CONUS grid
etss.tHHz.max.stormtide.ala3km.grib2 for 3.0 km Alaska grid

The guidance will be extended from 96 to 102 hours on the NCEP servers for:

etss.tHHz.stormsurge.con2p5km.grib2
etss.tHHz.stormtide.con2p5km.grib2
etss.tHHz.stormsurge.ala3km.grib2
etss.tHHz.stormtide.con625m.grib2
etss.tHHz.tide.con625m.grib2
etss.tHHz.stormsurge.ala3km.grib2
etss.tHHz.stormtide.ala3km.grib2
shef.etss.tHHz.totalwater.est
shef.etss.tHHz.totalwater.gom
shef.etss.tHHz.totalwater.wst
shef.etss.tHHz.totalwater.ber
shef.etss.tHHz.totalwater.goa
where HH is the cycle hour.

New 2.5 km CONUS and 3.0 km Alaska surge plus tide grid products on NDGD servers:

ds.etss-stormtide-2p5.bin
ds.etss-stormtide-3p0.bin

New 625 m CONUS surge plus tide and tide only grid products on NDGD servers:

ds.etss-stormtide-625m.bin
ds.etss-tide-625m.bin

ETSS Output Changes:

The NDGD directory structure for all ETSS CONUS and Alaska products will be split into five new folders according to valid period. Users will now find the output stripped of superheaders and routed into the appropriate day 1, day 2, etc. as defined below:

VP.001/ (day 1 guidance)
VP.002/ (day 2 guidance)
VP.003/ (day 3 guidance)
VP.004/ (day 4 guidance)
VP.005-007/ (day 5 through 7 guidance)

The station text format product and SHEF product for Gulf of Alaska contained in a tar file "etss.tHHz.shef_tar" that will be renamed on the NCEP servers as follows:

etss.tHHz.stormsurge.gok.txt => etss.tHHz.stormsurge.goa.txt
shef.etss.tHHz.totalwater.gok => shef.etss.tHHz.totalwater.goa
where HH is the cycle hour.

The 2.5 km CONUS and 3.0 km Alaska surge only grid products will be renamed on the NDGD servers as follows:

ds.etss-2p5.bin => ds.etss-stormsurge-2p5.bin ds.etss-3p0.bin => ds.etss-stormsurge-3p0.bin

All gridded binary version 2 (GRIB2) encoding was changed to use meters to three decimals instead of five, which significantly reduces the file size. No precision was lost as the actual data is in tenths of a foot which can be recovered uniquely from meters with three decimals.

The process ID in the GRIB2 messages was changed from 12 to 16 to allow P-Surge (12), ETSS (16) and P-ETSS (18) to be differentiated.

Some station identifiers in the station text format products (etss.tHHz.PROD.RGN.txt) are changing with this upgrade (e.g., CFWM1 CUTLER, ME is now 8411060 CUTLER, ME as we had not previously associated its Center for Operational Oceanographic Products and Services (CO-OPS) station ID to it).

The following files will be created later than in ETSS v2.1, due to the larger basin size for the West Coast:

mdl surge.HHw - seven minutes delayed
etss.tHHz.stormsurge.wst.txt - 11 to 12 minutes delayed
etss.tHHz.stormtide.wst.txt - 11 to 12 minutes delayed

After implementation day, the following new P-ETSS products will be found on the NCEP web dissemination sites:

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

Or the NWS National Digital Gridded Database (NDGD) dissemination sites:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.petss/AR.conus/>
<http://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.petss/AR.conus/>

The P-ETSS directory structure will match the new ETSS directory structure. Files will be placed into the respective folders for the valid period, such that:

VP.001/ (day 1 guidance)
VP.002/ (day 2 guidance)
VP.003/ (day 3 guidance)
VP.004/ (day 4 guidance)
VP.005-007/ (day 5 through 7 guidance)

New P-ETSS Products:

Station text format storm surge and storm tide products on NCEP servers:

petss.tHHz.NAME.stormsurge.RGN.txt
petss.tHHz.NAME.stormtide.RGN.txt

Where NAME is the product type (e10, e90=storm tide height exceeded by 10%, 90% of the ensemble members; max, mean and min=maximum, mean and minimum storm tide heights of the ensemble members); HH is the cycle hour and RGN is the region (est = East coast, gom = Gulf of Mexico, wst =West coast, ber = New Alaska Basin, goa = Gulf of Alaska).

Above NAVD-88 gridded products on NCEP servers:

Incremental hourly groups to hour 102 products for CONUS:
petss.tHHz.stormtide_NAME_1hr_inc_dat.con2p5km.grib2
petss.tHHz.stormtide_NAME_1hr_inc_dat.con625m.grib2

Incremental hourly groups to hour 102 products for Alaska:
petss.tYYYYMMDDHHz.stormtide_NAME_1hr_inc_dat.ala3km.grib2

Cumulative 6-hourly groups to hour 102 products: CONUS
petss.tHHz.stormtide_NAME_6hr_cum_dat.con2p5km.grib2
petss.tHHz.stormtide_NAME_6hr_cum_dat.con625m.grib2
Alaska petss.tHHz.stormtide_NAME_1hr_cum_dat.ala3km.grib2

Above ground level (AGL) gridded products on NCEP servers:
Incremental 6-hourly groups to hour 102 products: CONUS
petss.tHHz.stormtide_NAME_6hr_inc_agl.con2p5km.grib2
petss.tHHz.stormtide_NAME_6hr_inc_agl.con625m.grib2
Alaska petss.tHHz.stormtide_NAME_6hr_inc_agl.ala3km.grib2

Cumulative 6-hourly groups to hour 102 products: CONUS
petss.tHHz.stormtide_NAME_6hr_cum_agl.con2p5km.grib2
petss.tHHz.stormtide_NAME_6hr_cum_agl.con625m.grib2
Alaska petss.tHHz.stormtide_NAME_6hr_cum_agl.ala3km.grib2

Where NAME is the product type (e10, e20, e30, e40, e50, e90=storm tide height exceeded by 10, 20, 30, 40, 50, 90% of the ensemble members; max, mean, min=maximum, mean, minimum storm tide height of the ensemble members; and gt1, gt2, gt3, gt4, gt5, gt6, gt7, gt8, gt9, gt10, gt13, gt16 ft=Probability of storm tide height greater than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 16 feet above NAVD-88) and HH is the cycle hour.

Output will also be available on the NDGD server. A full description of the directory/file structure is available here:

<http://www.nco.ncep.noaa.gov/pmb/changes/docs/NDGD-PETSS.pdf>

NOAAPort/Satellite Broadcast Network (SBN) Changes:

ETSS Gridded Data Removal:

Once the NWS Advanced Weather Interactive Processing System (AWIPS) program is ready, the surge only CONUS 5 km and Alaska 6 km will be discontinued as higher resolution 2.5 and 3.0 km replacement products are available. The surge only CONUS 5 km and Alaska 6 km World Meteorological Organization (WMO) headers are as follows:

WMO Heading	Region
-----	-----
LHU... KNHC	NDFD CONUS 5 km surge only grid
LHR... KNHC	NDFD Alaska 6 km surge only grid

The "... " in the WMO heading is replaced by DHH where D is the day of the forecast (A=Day 0, B=Day 1, ..., F=Day 5) and HH is the hour of day when the forecast is valid. A full description of WMO header combinations per forecast cycle is available here:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/ETSS_removal_headers.pdf

ETSS Gridded Data Additions:

The surge only CONUS 2.5 km and Alaska 3.0 km gridded products are being extended from 96 hours to 102 hours. Their WMO headers are as follows:

WMO Heading	Region
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MHU... KNHC	NDFD CONUS 2.5 km surge only grid
MHR... KNHC	NDFD Alaska 3.0 km surge only grid

The "... " in the WMO heading is replaced by DHH where D is the day of the forecast (A = Day 0, B=Day 1, ..., F=Day 5) and HH is the hour of day when the forecast is valid. A full description of WMO header combinations per forecast cycle is available here:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/ETSS_headers1.pdf

The surge plus tide CONUS 2.5 km and Alaska 3.0 km gridded products are being added for 0 to 102 hours. Their WMO headers are as follows:

WMO Heading	Region
MPQ... KNHC	NDFD CONUS 2.5 km surge plus tide grid
LPQ... KNHC	NDFD Alaska 3.0 km surge plus tide grid

The tide only and surge plus tide CONUS 625 m gridded products are being added for 0 to 102 hours. Their WMO headers are as follows:

WMO Heading	Region
MPU... KNHC	NDFD CONUS 625 m surge plus tide grid
LPU... KNHC	NDFD CONUS 625 m tide only grid

The "... " in the WMO heading is replaced by DHH where D is the day of the forecast (A = Day 0, B=Day 1, ..., F = Day 5) and HH is the hour of day when the forecast is valid. A full description of the header combinations per forecast cycle is available here:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/ETSS_headers2.pdf

P-ETSS Gridded Data Addition:

The following P-ETSS surge plus tide gridded products are being added for 0 to 102 hours:

- CONUS 625 m, CONUS 2.5 km and Alaska 3.0 km resolution cumulative 6-hourly groups for 10%, 20%, 30%, 40%, 50% and 90% exceedance above NAVD-88 and AGL.
- CONUS 625 m, CONUS 2.5 km and Alaska 3.0 km resolution incremental 6-hourly groups for 10%, 20%, 30%, 40%, 50% and 90% exceedance AGL.
- CONUS 2.5 km and Alaska 3.0 km resolution incremental hourly groups for 10%, 50% and 90% exceedance above NAVD-88.
- CONUS 625 m, CONUS 2.5 km and Alaska 3.0 km resolution cumulative 6-hourly groups for probability of Surge > 1, 2, 3, 6 and 10 feet above NAVD-88 and AGL.
- CONUS 625 m, CONUS 2.5 km and Alaska 3.0 km resolution incremental 6-hourly groups for probability of Surge > 1, 2, 3, 6 and 10 feet AGL.
- CONUS 2.5 km and Alaska 3.0 km resolution incremental hourly groups for probability of Surge > 1, 2, 3, 6 and 10 feet above NAVD-88.
- CONUS 625 m, CONUS 2.5 km and Alaska 3.0 km resolution incremental 6-hourly groups of ensemble Minimum (Min), Mean and Maximum (Max) AGL.
- CONUS 2.5 km and Alaska 3.0 km resolution incremental hourly groups of ensemble Min, Mean and Max above NAVD-88.

Their WMO header scheme is available here:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/P-ETSS_WMO_Header_Scheme.pdf

A full chart of the header combinations per forecast cycle is available here:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/P-ETSS_headers.pdf

As part of NCEP's standard 30 day parallel testing, the updated products will be available here:

<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/etss/para/>
<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/petss/para/>

Any questions, comments or requests regarding this implementation should be directed to the contacts below. We will review any feedback and decide whether to proceed.

For changes and additions to the Extra-Tropical Storm Surge guidance, please contact:

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National Service Change Notices are online at:

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

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