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PNSWSH

Service Change Notice 26-41
National Weather Service Headquarters Silver Spring MD
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From: Mark Willis
NWS Office of Science and Technology Integration
Meteorological Development Laboratory

Subject: Probabilistic Tropical Cyclone Storm Surge (P-Surge) Model Upgrade: Effective May 26, 2026

Effective on or about May 26, 2026, starting with the 1200 Coordinated Universal Time (UTC) cycle, the National Centers for Environmental Prediction (NCEP) will upgrade the Probabilistic Tropical Cyclone Storm Surge model (P-Surge) to version 3.2.

P-Surge is based on an ensemble of Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model runs which are derived from the National Hurricane Center (NHC) official advisory along with NHC's historical errors in forecasts of the storm's track, size, and intensity. P-Surge currently is run on a case-by-case basis in advance of hurricanes and tropical storms that may impact the Atlantic and Gulf Coasts of the Contiguous United States (CONUS), Puerto Rico and the U.S. Virgin Islands, and Hawaii.

P-Surge version 3.2 includes the following updates:

A. Replace the underlying computational grid for Puerto Rico with a higher resolution one. The resolution of the new grid will be ~400m at the shoreline enabling P-Surge to properly support the 625m output grid.

B. Adjust how the code detects land when constructing the primary storm parameterization thereby allowing the code to properly decay the storm. This enables it to hold the previous over-ocean forecasts for both maximum wind speed and radius of maximum winds constant until landfall which will improve forecast-to-forecast consistency. This adjustment is only being applied to the CONUS for this implementation, with other regions to be considered in the future.

C. Experimentally generate experimental Standard Hydrologic Exchange Format (SHEF) products for 10, 50, and 90% exceedances at stations. The data will be available via NOAA's Operational Model Archive and Distribution System (NOMADS) with this implementation. Follow-on implementations will gather WMO headers to enable it to be placed on the Satellite Broadcast

Network (SBN).

D. Update the NHC forecast error statistics used for the Atlantic (i.e., the CONUS and Puerto Rico domains) and Central Pacific (i.e., the Hawaiian domains). This adds four newer tropical cyclones which made landfall (2024: Beryl, Francine, Helene, and Milton) while dropping an older one (2019: Dorian).

E. Improve method to detect when to stop running a storm. Previously, it did not properly consider very large tropical cyclones (TC) that were larger than a SLOSH basin, which resulted in large TC perturbations being prematurely stopped.

F. Other various code optimizations.

Dissemination Changes:

NCEP NOMADS web services:
There will be no change to the directory structure on NOMADS. All data from CONUS, Puerto Rico / U.S. Virgin Islands, and Hawaii products will be present in the same directory:
https://nomads.ncep.noaa.gov/pub/data/nccf/com/psurge/prod/

We are introducing SHEF products for CONUS and Puerto Rico and US Virgin Islands, which will have suffixes of '.shef'. Follow on implementations will pursue SHEF products for other regions.

Examples of the new NOMADS SHEF filenames:

BB##YYYY_YYYYMMDD_conus_eEE.shef
BB##YYYY_YYYYMMDD_puertori_eEE.shef
(where BB## is the storm number,
YYYY is the year,
YYYYMMDDHH is the date and hour, and
EE is exceedance above Mean-Lower-Low-Water (10, 50, 90))

We are discontinuing the 0-80 hour message in the cumulative above datum (cum_dat) products in favor of the already existing 0-102 hour message. This only impacts the CONUS region as we didn't create 0-80 hour messages for the Puerto Rico and US Virgin Islands region, nor for the Hawaiian region. The GRIB files will continue to exist, but will have 1 message instead of
2.

Examples of the impacted NOMADS GRIB filenames:

psurge.tYYYYMMDDHHz.BB##YYYY_eEE_cum_dat.h102.conus_625m.grib2
psurge.tYYYYMMDDHHz.BB##YYYY_gtF_cum_dat.h102.conus_625m.grib2
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,
YYYY is the year,
EE is the exceedance above datum (NAVD-88) (10, 20, 30, 40, 50, 60, 70, 80, 90), and
F is the feet above datum (NAVD-88) (2, 3, ..., 20))

NOAAPORT/SBN:
The products are available over the SBN and NOAAPORT in GRIB2 format. A complete list of WMO Header IDs for the products can be found online at the top of the Meteorological Development Laboratory's storm surge technical notices here:
https://vlab.noaa.gov/web/mdl/technical-notices-storm-surge

or more directly at:
https://vlab.noaa.gov/documents/6609493/7858383/P-Surge-v3.2-Headers.pdf/dff16835-e0cd-d532-d434-bb46d556a7cd?t=1772028616342

Note, due to bandwidth limitations, some of the products on NOMADS are not disseminated over the SBN. The SBN will contain the following:

6-hourly cumulative and incremental products to 102 hours:
   A. (10, 20, 30, 40, 50, 90)% exceedance above ground level
   B. Probability of > (1, 2, 3, ..., 10) feet above ground level

102-hourly cumulative products:
   A. (10, 20, 30, 40, 50, 90)% exceedance above datum
   B. Probability of > (2, 3, 4, ..., 15) feet above datum

Several canned test runs will be available for testing. The data will be hosted on the NCEP HTTPS sites at the following URLs when they are available, although they may not be present for the entire 30-day period:
https://nomads.ncep.noaa.gov/pub/data/nccf/com/psurge/para/

NCEP encourages users to ensure their decoders are flexible and are able to adequately handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and any volume changes that may be forthcoming. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes prior to any implementations.

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 questions regarding the science changes, please contact

Arthur Taylor
Meteorological Development Laboratory
Arthur.Taylor@noaa.gov

For questions about the dataflow aspects, please contact:

Margaret Curtis
NCEP Central Operations HPC Dataflow Team Lead
ncep.pmb.dataflow@noaa.gov

National Service Change Notices are online at:
https://www.weather.gov/notification/

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