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PNSWSH

Service Change Notice 25-31
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From: Judy Ghirardelli
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Meteorological Development Laboratory

Subject: Probabilistic Tropical Cyclone Storm Surge (P-Surge) Model Upgrade: Effective April 29, 2025

Effective on or about April 29, 2025, 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 3.1.

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) as well as for storms that may impact Puerto Rico and the U.S. Virgin Islands. With this implementation, P-Surge will be able to be run for Hawaii.

P-Surge version 3.1 includes the following updates:

A. Creation of P-Surge products for Hawaii that account for surge, tide, and waves, similar to the P-Surge products available for Puerto Rico and the U.S. Virgin Islands. P-Surge products for the CONUS only account for surge and tide. This implementation represents the first time that P-Surge will provide guidance for the Hawaii domain.
B. More efficient calculation of waves which reduces the processing time for Puerto Rico and the U.S. Virgin Islands products.
C. Discontinuing the probability of > 0 feet above ground level products for the CONUS and Puerto Rico / U.S. Virgin Islands domains.
D. Various code optimizations.

Dissemination Changes:

NCEP NOMADS and FTPPRD web services:
There will be no change to the directory structure on NOMADS and FTPPRD. 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/
ftp://ftpprd.ncep.noaa.gov/data/nccf/com/psurge/prod/

However, we are introducing Hawaii GRIB2 files, which will have "hawaii_312p5m" (vs "conus_625m" for CONUS or "puertori_625m" for Puerto Rico / U.S. Virgin Islands) in their file names.

Examples of new NOMADS/FTPPRD Hawaii GRIB2 filenames:

psurge.tYYYMMDDHHz.BB##YYYY_eEE_cum_agl.h102.hawaii_312p5m.grib2
psurge.tYYYMMDDHHz.BB##YYYY_eEE_inc_agl.h102.hawaii_312p5m.grib2
psurge.tYYYMMDDHHz.BB##YYYY_gtF_cum_agl.h102.hawaii_312p5m.grib2
psurge.tYYYMMDDHHz.BB##YYYY_gtF_inc_agl.h102.hawaii_312p5m.grib2
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,
YYYY is the year,
EE is the exceedance above ground level (10, 20, 30, 40, 50, 90), and
F is the feet above ground level (1, 2, 3, ..., 20))

psurge.tYYYMMDDHHz.BB##YYYY_eEE_cum_dat.h102.hawaii_312p5m.grib2
psurge.tYYYMMDDHHz.BB##YYYY_gtF_cum_dat.h102.hawaii_312p5m.grib2
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,
YYYY is the year,
EE is the exceedance above datum (10, 20, 30, ..., 90),
and
F is the feet above datum (1, 2, 3, ..., 20))

psurge.tYYYMMDDHHz.BB##YYYY_eEE_inc_dat.h102.hawaii_312p5m.grib2
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,
YYYY is the year, and
EE is the exceedance above datum (10, 20, 30, 40, 50, 90))

Additionally, we are introducing shapefiles, which will have suffixes of "HI.zip" (vs ".zip" for CONUS or "PR.zip" for Puerto Rico / U.S. Virgin Islands) in their filenames.

Examples of the new NOMADS/FTPPRD Hawaii shapefile filenames:

shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_eEE_cum_agl_HI.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_eEE_inc_agl_HI.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gtF_cum_agl_HI.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gtF_inc_agl_HI.zip
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,

YYYY is the year,
EE is the exceedance above ground level (10, 20, 30,
40, 50, 90), and
F is the feet above ground level (1, 2, 3, ..., 20))

shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_eEE_cum_dat_HI.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gtF_cum_dat_HI.zip
(where YYYYMMDDHH is the date and hour,
BB## is the storm number,
YYYY is the year,
EE is the exceedance above datum (10, 20, 30, ... 90),
and
F is the feet above datum (1, 2, 3, ..., 20))

We are discontinuing the probability of greater than zero feet above ground level products.

Examples of NOMADS/FTPPRD files being removed:

psurge.tYYYYMMDDHHz.BB##YYYY_gt0_cum_agl.h102.conus_625m.grib2
psurge.tYYYYMMDDHHz.BB##YYYY_gt0_inc_agl.h102.conus_625m.grib2
psurge.tYYYYMMDDHHz.BB##YYYY_gt0_cum_agl.h102.puertori_625m.grib2
psurge.tYYYYMMDDHHz.BB##YYYY_gt0_inc_agl.h102.puertori_625m.grib2
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gt0_cum_agl.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gt0_inc_agl.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gt0_cum_agl_PR.zip
shpfiles/psurge_tYYYYMMDDHHz_BB##YYYY_gt0_inc_agl_PR.zip
(where YYYYMMDDHH is the date and hour,
BB## is the storm number, and
YYYY is the year)

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/storm-surge-technical-notices

or more directly at:
https://vlab.noaa.gov/documents/6609493/7858383/Mar2025-P-Surge-v3.1-Headers-Actual.pdf/4c5385e0-d176-c94f-9dc0-7ef999c931c5?t=1743002554830

Note, due to bandwidth limitations, some of the products on NOMADS/FTPPTRD 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

We are discontinuing the probability of > 0 feet above ground level products. The GRIB2 products have a WMO header scheme of "T1-T2-A1-A2-i-i CCCC" described here:
https://vlab.noaa.gov/documents/6609493/7858383/Mar2025-P-Surge-v3.1-Headers-Scheme.pdf/374cd7a8-096b-6aff-59d5-f0ce4985c7e9?t=1743002561991

In that scheme T2=C or D and A1=A indicates a "Probability of Surge > 0 feet above ground level," so those products will no longer be generated. Specifically for CCCC=KWEV T1=Y or Z, and CCCC=KWEW T1=Z the following T2-A1-A2-i-i headers will no longer be generated:

CAB03, CAB09, CAB15, CAB21, CAC03, CAC09, CAC15, CAC21,
CAD03, CAD09, CAD15, CAD21, CAE03, CAE09, CAE15, CAE21,
CAF03, CAF09, CAF15, CAF21

DAB03, DAB09, DAB15, DAB21, DAC03, DAC09, DAC15, DAC21,
DAD03, DAD09, DAD15, DAD21, DAE03, DAE09, DAE15, DAE21,
DAF03, DAF09, DAF15, DAF21

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/
https://ftp.ncep.noaa.gov/data/nccf/com/psurge/para/
https://ftpprd.ncep.noaa.gov/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

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For questions about the dataflow aspects, please contact:

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

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