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Service Change Notice 26-51
National Weather Service Headquarters Silver Spring, MD
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From: Corey Allen
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NOS/Office of Coast Survey

Subject: Upgrade of the Surge and Tide Operational Forecast System (STOFS) to Version 3.1 Effective July 7, 2026

Effective on or about July 7, 2026, beginning with the 1200 Universal Coordinated Time (UTC) cycle, the National Centers for Environmental Prediction (NCEP) Central Operations (NCO) will upgrade the Surge and Tide Operational Forecast System (STOFS) to Version 3.1.0. This implementation may be delayed if there is declaration of either an Enhanced Weather situation or Critical Weather Day.

STOFS V3.1.0 represents a major upgrade of the STOFS modeling system, last upgraded in May 2024. STOFS V3.1.0 contains several enhancements improving model performance, resolution, and coverage, including upgrades to both the global (STOFS-2D-Global) and Atlantic (STOFS-3D-Atlantic) components, and the addition of a new component for the Pacific (STOFS-3D-Pacific).

Model upgrades for STOFS-2D-Global (ADCIRC-based) include:

- Inclusion of a gridded bias correction. This bias correction uses the current station bias correction approach used in operational STOFS-2D-Global (v2.1), which corrects the station water level forecast guidance biases by removing the bias between the observed water levels at NOS/CO-OPS stations and most recent 5 days of nowcast water levels. This bias correction at stations is then propagated across the entire global grid using a graph diffusion approach. The result is that both station and gridded output is bias corrected.

- Addition of a few stations to the station output, as requested by National Weather Service forecast offices: Bogue Sound at Emerald Isle, NC; White Oak River at Swansboro, NC; Kings Bay MSF Pier, GA; and TEMCO Kalama Terminal, WA. Also, some redundant stations are removed from the output: Duck, NC; Fort Point, NH; Money Point, VA; and Springmaid Pier, SC. South Amboy, NJ was removed as it is no longer active and S Amboy Raritan River, NJ is the active station in that area. Finally, Naples Bay, North, FL has an updated NOS ID from 8725110 to 8725114.

Model upgrades for STOFS-3D-Atlantic (SCHISM-based) include:

- Major improvements to the mesh in watersheds (rivers, levees) and coastal areas (barrier islands, jetties/breakwaters, Intracoastal Waterway); and local mesh refinements requested by the community. These refinements resulted in improvements to the water level forecast guidance.

- Inclusion of a dynamic adjustment (bias correction) of open boundary conditions, to account for missing physics in the model, including steric effects, to improve the model's overall accuracy. This bias correction is calculated by averaging the model's nowcast bias for the past two days over 11 U.S. East Coast open coast NOS/CO-OPS stations. This bias is then uniformly applied to the open boundary conditions to force the model simulations.

- Station netCDF output will now be referenced to local mean sea level (LMSL) (no longer NAVD88), while gridded output will remain referenced to xGEOID20b. Station SHEF output will remain referenced to Mean Lower Low Water (MLLW).

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Lastly, a component for the Pacific called STOFS-3D-Pacific is being added, which will use the SCHISM model core. This component will provide 3D baroclinic and surface current coverage for the north Pacific basin, from 30 degrees South to the Bering Strait. STOFS-3D-Pacific will use input from the National Water Model and Copernicus' Global Flood Awareness System (GloFAS) global hydrology to include inland hydrology and extreme precipitation effects on coastal flooding, and will also provide surface currents for marine navigation use.

Output changes for NCEP NOMADS web services

A. File additions:
The below are additional files being sent to NCEP NOMADS for STOFS-2D-Global.

stofs_2d_glo.tCCz.fields.cwl.maxele.nc
stofs_2d_glo.tCCz.fields.cwl.maxele.noanomaly.nc
stofs_2d_glo.tCCz.points.cwl.noanomaly.nc
stofs_2d_glo.tCCz.fields.cwl.noanomaly.nc

These are the additional files for STOFS-3D-Pacific:

stofs_3d_pac.t12z.field2d_nhhh1_hhh2.nc
stofs_3d_pac.t12z.field2d_fhhh1_hhh2.nc

stofs_3d_pac.tCCz.fields.out2d_nhhh1_hhh2.nc
stofs_3d_pac.tCCz.fields.out2d_fhhh1_hhh2.nc
stofs_3d_pac.tCCz.{ncast,fcast}.station.profile.nc
stofs_3d_pac.tCCz.points.cwl.temp.salt.vel.nc
stofs_3d_pac.tCCz.points.cwl.shef
stofs_3d_pac.tCCz.fields.cwl.maxele.nc
stofs_3d_pac.tCCz.alaska.f{hour}.grib2 (where {hour}={000-048})
stofs_3d_pac.tCCz.alaska.cwl.grib2
stofs_3d_pac.tCCz.conus.west.f{hour}.grib2 (where {hour}={000-048})
stofs_3d_pac.tCCz.conus.west.cwl.grib2
stofs_3d_pac.tCCz.guam.f{hour}.grib2 (where {hour}={000-048})
stofs_3d_pac.tCCz.guam.cwl.grib2
stofs_3d_pac.tCCz.hawaii.f{hour}.grib2 (where {hour}={000-048})
stofs_3d_pac.tCCz.hawaii.cwl.grib2
stofs_3d_pac.tCCz.northpacific.f{hour}.grib2 (where {hour}={000-048})
stofs_3d_pac.tCCz.northpacific.cwl.grib2

(where {nhhh1_hhh2}={n001_012,n013_024},
{fhhh1_hhh2}={f001_012,f013_024,f025_036,f037_048}, and
where tCCz is forecast cycle: CC = 12)

B. Timeliness changes:
For STOFS-2D-Global, stofs_2d_glo.t00z.points.cwl.nc (where tCCz
is forecast cycle: CC = 00,06,12,18) will be available about 15
minutes earlier. All other STOFS-2D-Global files will be available at
about the same time as v2.1.All STOFS-3D-Atlantic files will be available
at about the same time as v2.1.

C. File size changes:
The refinements performed on the STOFS-3D-Atlantic mesh change
the following STOFS-3D-Atlantic file sizes:

stofs_3d_atl.t12z.field2d_nhhh1_hhh2.nc
stofs_3d_atl.t12z.field2d_fhhh1_hhh2.nc
stofs_3d_atl.tCCz.fields.out2d_nhhh1_hhh2.nc
stofs_3d_atl.tCCz.fields.out2d_fhhh1_hhh2.nc
stofs_3d_atl.tCCz.conus.east.cwl.grib2
stofs_3d_atl.tCCz.puertori.cwl.grib2

(where {nhhh1_hhh2}={n001_012,n013_024}, and
{fhhh1_hhh2}={f001_012,f013_024,f025_036,f037_048,f049_060,f061_072,f073_
084,f085_096})
where tCCz is forecast cycle: CC = 12

A consistent parallel feed of data is available on the NCEP
HTTPS sites at the following URLs:
https://nomads.ncep.noaa.gov/pub/data/nccf/com/stofs/para/
https://nomads.ncep.noaa.gov/pub/data/nccf/com/para/noaaport/stofs_2d_glo
/

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:
Greg Seroka
Coastal Marine Modeling Branch
Coast Survey Development Laboratory
NOAA/NOS/Office of Coast Survey
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For questions regarding the data flow aspects of these datasets, contact:
Margaret Curtis
NWS Central Operations HPC Dataflow Team Lead
College Park, Maryland
ncep.pmb.dataflow@noaa.gov

National Service Change Notices are online at:

www.weather.gov/notification/

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