

NOUS41 KWBC 131540
PNSWSH

Service Change Notice 26-64
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: David Michaud
 Director
 NWS Central Operations

Subject: Upgrade of National Water Model and related post processing
system on NWS's WCOSS system Effective: August 12, 2026

Effective on or about August 12th, 2026, beginning with the 1200
Coordinated Universal Time (UTC) run, the National Weather Service (NWS)
will begin operationally running Version 3.1 of the National Water Model
(NWM) on the Weather and Climate Operational Supercomputing System
(WCOSS).

The NWM is an hourly cycling uncoupled analysis and forecast system that
provides streamflow for over 3.2 million river reaches, Total Water Level
(TWL) guidance for coastal regions, and other hydrologic information on
grids ranging in resolution from 100m to 1km. It also provides
complementary hydrologic guidance at current NWS River Forecast Center
(RFC) river forecast locations and significantly expanded guidance in
coverage and type in underserved locations. Further information on the
observation- and model-based forcing sources used by the NWM, along with
details on the NWM domain and modeling
components, can be found at: <https://water.noaa.gov/about/nwm>

The NWM post-processing application ingests raw NWM channel, land and
forcing files and then creates subsetted data files and derived variables
for NWS River Forecast Centers and Weather Forecast Offices. The
subsetting of data is intended to reduce system and network resource
usage in obtaining critical NWM data of interest. This post-processing
also supports Office of Water Prediction (OWP) web services and
operations with map service data for select NWM variables.

(A) Enhancements in the Model Version 3.1

Version 3.1 of the NWM contains several notable upgrades over the current
operational version. These include:

CONUS Domain

-Representation of the flow diversion between the Mississippi and Atchafalaya Rivers via observation-based flow persistence through the Old River Control Structure. Water is diverted from gauge 07381482 by removing water from FeatureID 19269940 and adding it to FeatureID 19406874. The diversion uses the last observed streamflow values at the gauge (07381482) and persists the streamflow.

-Improved downscaling of temperature forcing data via an NWP model data-based dynamic lapse rate approach

-Use of Multi-Radar/Multi-Sensor System (MRMS) and Numerical Weather Prediction (NWP)-based precipitation-type information within CONUS Analysis and Assimilation (AnA), Short-Range, and GFS-based Medium-Range configurations

-Incorporation of Field feedback on Standard Hydrometeorological Exchange Format (SHEF) output locations (25 new locations, one shifted location)

-Alteration of Medium-Range coastal Atlantic Gulf and Pacific domain forecast lengths from 10 days to 5 days to decrease run time and output latency by ~70% when combined with software optimization mentioned below

-Inclusion of updated Atlantic-Gulf topography-bathymetry data for the coastal model along portions of the Florida, North Carolina, Virginia, and Maryland coastlines

-Use of bias-corrected STOPS 2D model data as boundary condition input into the NWM coastal Total Water Level (TWL) component

-Updated NWM CONUS hydrofabric with location refinements for 311 USGS stream gauges, improving their representation in the NWM Analysis and Assimilation configuration.

-Addressing NWS Field hydrofabric-related requests, assimilation of gauge data for the Trinity River at Liberty Texas, the Niagara River near Buffalo New York, along with routing fixes for the Sabine River near Carthage Texas, the Mill Race near Amana Iowa, and the Kankakee River near Shelby Indiana.

Puerto Rico / USVI Domain

-New P-surge-forced Short-Range coastal forecast configuration, executed when P-surge data is available

- Use of NBM precipitation in Puerto Rico Short-Range configurations in place of WRF-ARW as supplemental precipitation forcing for inland and coastal configurations.

-New 00Z and 12Z Short-Range forecast cycles for both inland and coastal configurations.

All Domains

-Significant decrease in coastal model runtime via code optimization (see section D)

- Application of coastal model sink term beyond the 2m topobathy line to reduce ponding of water in DEM pits

-Assimilation of USGS streamflow observations available at the forecast execution time into the corresponding beginning hours of the NWM short-, medium-, and long-range forecasts. The initial forecast period overlapping with available observations will thus track observed values

(B) Model Output Changes

Model output is available via NWS web services here:

<https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm>

B1. Additions to existing files

- A new LQFRAC variable added in v3.1 (not present in v3.0) for CONUS Analysis and Assimilation, Short-Range, and Medium-Range forcing configurations.

B2. Altered duration of existing forecast run

- The medium_range_blend_coastal_RR and medium_range_coastal_RR_mem1 directories reduced the number of forecast hours from 240 to 120.

nwm.tCCz.medium_range_blend_coastal.total_water.fFFF.RR.nc

nwm.tCCz.medium_range_coastal.total_water.fFFF.RR.nc

Where RR is domain (atl_gulf,pacific), CC is cycle

(00,06,12,18), and FFF is forecast hour (001-120)

B3. New Coastal P-Surge-forced Total Water Level Output for

Short-Range Puerto Rico and NDFD Medium-range Atl_gulf domains.

New elements in the new files are detailed in Appendix 2 at the end of this notice.

- Coastal P-surge Short Range file in short_range_coastal_puertorico_psurge/

nwm.tCCz.short_range_coastal.total_water.psurge.fFFF.puertorico.nc

nwm.tCCz.short_range_coastal.total_water.psurge.puertorico.shf

Where CC is the cycle (00,06,12,18), and FFF is forecast hour (001-048) for Puerto Rico. Note that only the 00z and 12z cycles are new for the Puerto Rico Domain.

Note: These output files and associated output directory are only created when upstream Psurge forcing data is available and this particular NWM configuration executes.

(C) Post-Processing Application Output Changes

C1. Post-Processed files are now available in directories tagged by date, where YYYY represents the four-digit year of output, MM represents the two-digit month of output, and DD represents the two-digit day of output.

Note that the date has been removed from the name of each post-processed file, and now resides in the directory name (i.e., NWM.YYYYMMDD).

C2. Note that the IMAGES sub-directory is being removed from the post-processed data point. This will eliminate pre-generated PNG images of several NWM output fields previously hosted in this location. Additionally, the streamflow_anomaly field will no longer be available in the WMS directory.

C3. The Post-processed Web Map Service (WMS) data will be available on the NWS Web Services here:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm/prod/nwm.YYYYMMDD/post_processed/WMS/

- Analysis and Assimilation files in
analysis_assim/forcing/
nwm.t{00..23}z.analysis_assim.forcing.tm{00,01,02}.alaska.nc
nwm.t{00..23}z.analysis_assim.forcing.tm00.conus.nc
nwm.t{00..23}z.analysis_assim.forcing.tm00.hawaii.nc
nwm.t{00..23}z.analysis_assim.forcing.tm00.puertorico.nc

analysis_assim/channel_rt/
nwm.t{00..23}z.analysis_assim.channel_rt.tm{00,01,02}.alaska.nc
nwm.t{00..23}z.analysis_assim.channel_rt.tm00.conus.nc
nwm.t{00..23}z.analysis_assim.channel_rt.tm{0000,0015,0030,0045}.hawaii.nc
nwm.t{00..23}z.analysis_assim.channel_rt.tm00.puertorico.nc

analysis_assim/land/
nwm.t{00..23}z.analysis_assim.land.tm{00,01,02}.alaska.nc
nwm.t{00..23}z.analysis_assim.land.tm00.conus.nc
nwm.t{00..23}z.analysis_assim.land.tm{0000,0015,0030,0045}.hawaii.nc
nwm.t{00..23}z.analysis_assim.land.tm00.puertorico.nc
- Extended Analysis and Assimilation files in
analysis_assim_extend/forcing/
nwm.t20z.analysis_assim_extend.forcing.tm{00..31}.alaska.nc

analysis_assim_extend/land/
nwm.t20z.analysis_assim_extend.land.tm00.alaska.nc
- Short Range files in
short_range/forcing/
nwm.t{00,03,..21}z.short_range.forcing.15hours.alaska.nc
nwm.t{00..23}z.short_range.forcing.18hours.conus.nc
nwm.t{00,12}z.short_range.forcing.48hours.hawaii.nc
nwm.t{00,12}z.short_range.forcing.{day1,day2}.hawaii.nc
nwm.t{00,06,12,18}z.short_range.forcing.48hours.puertorico.nc
nwm.t{00,06,12,18}z.short_range.forcing.{day1,day2}.puertorico.nc

short_range/channel_rt/
nwm.t{00,03,..21}z.short_range.channel_rt.alaska.nc
nwm.t{00..23}z.short_range.channel_rt.conus.nc
nwm.t{00,12}z.short_range.channel_rt.hawaii.nc

```

nwm.t{00,06,12,18}z.short_range.channel_rt.puertorico.nc

- Medium-Range files in
medium_range/forcing/
nwm.t{00,06,12,18}z.medium_range.forcing.day{1..10}.alaska.nc
nwm.t{00,06,12,18}z.medium_range.forcing.day{1..10}.conus.nc

medium_range/channel_rt/
nwm.t{00,06,12,18}z.medium_range.channel_rt_{1..6}.alaska.nc
nwm.t{00,06,12,18}z.medium_range.channel_rt.alaska.nc
nwm.t{00,06,12,18}z.medium_range.channel_rt_{1..6}.conus.nc
nwm.t{00,06,12,18}z.medium_range.channel_rt.conus.nc

- Blend Medium Range files in
medium_range_blend/forcing/
nwm.t{00,06,12,18}z.medium_range_blend.forcing.day{1..10}.alaska.nc
nwm.t{00,06,12,18}z.medium_range_blend.forcing.day{1..10}.conus.nc

medium_range_blend/channel_rt/
nwm.t{00,06,12,18}z.medium_range_blend.channel_rt.alaska.nc
nwm.t{00,06,12,18}z.medium_range_blend.channel_rt.conus.nc

- Long-Range files in
long_range/channel_rt/
nwm.t{00,06,12,18}z.long_range.channel_rt_{1..4}.conus.nc
nwm.t{00,06,12,18}z.long_range.channel_rt.conus.nc

```

C4. The post-processed data for the 13 River Forecast Centers (RFC) will be available via the NWS Web Services here:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm/prod/nwm.YYYYMMDD/post_processed/RFC/

```

- CONUS domain files are in the AB, CB, CN, LM, MA, MB, NC,
  NE, NW, OH, SE, WG directories:
channel_rt/
nwm.t{00..23}z.analysis_assim.channel_rt.tm{00,01,02}.RRrfc.nc
nwm.t{00..23}z.analysis_assim_no_da.channel_rt.tm{00,01,02}.RRrfc.nc
nwm.t{00..23}z.analysis_assim_long.channel_rt.tm{00..11}.RRrfc.nc
nwm.t{00..23}z.analysis_assim_long_no_da.channel_rt.tm{00..
11}.abrffc.nc
nwm.tl6z.analysis_assim_extend.channel_rt.tm{00..27}.RRrfc.nc
nwm.tl6z.analysis_assim_extend_no_da.channel_rt.tm{00..27}.RRrfc.nc
nwm.t{00,06,12,18}z.long_range.channel_rt_{1..4}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range_blend.channel_rt.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range.channel_rt_{1..6}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range_no_da.channel_rt.RRrfc.nc
nwm.t{00,06,12,18}z.short_range.channel_rt.RRrfc.nc
    Where RR is the RFC name (AB).

```

```

land/
nwm.t{00..23}z.analysis_assim.land.tm{00,01,02}.RRrfc.nc
nwm.tl6z.analysis_assim_extend.land.tm{00..27}.RRrfc.nc
nwm.t{00,06,12,18}z.analysis_assim_long.land.tm{00..11}.RRrfc.nc

```

```

nwm.t{00,06,12,18}z.long_range.land_{1..4}.f{024,048,...,720
}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range_blend.land.f{003,006,...,24
0}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range.land_1.f{003,006,...,240}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range.land_{2..6}.f{003,006,...,2
04}.RRrfc.nc
nwm.t{00..23}z.short_range.land.f{001..018}.RRrfc.nc
    Where RR is the RFC name (AB).

```

```

forcing/
nwm.t{00..23}z.analysis_assim.forcing.tm{00,01,02}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range.forcing.f{001..240}.RRrfc.nc
nwm.t{00,06,12,18}z.medium_range_blend.forcing.f{001..240}.RRrfc.nc
nwm.t{00,06,12,18}z.short_range.forcing.f{001..018}.RRrfc.nc
    Where RR is the RFC name (AB).

```

- Alaska and Hawaii domains files are in the AP directory.
channel_rt/
nwm.t{00..23}z.analysis_assim.channel_rt.tm{00,01,02}.alaska.aprfc.nc
a.aprfc.nc
nwm.t{00..23}z.analysis_assim_no_da.channel_rt.tm{00,01,02
}.alaska.aprfc.nc
nwm.t20z.analysis_assim_extend.channel_rt.tm{00..31}.alaska.aprfc.nc
nwm.t20z.analysis_assim_extend_no_da.channel_rt.tm{00..31}.
alaska.aprfc.nc
nwm.t{00,03,...,21}z.short_range.channel_rt.alaska.aprfc.nc
nwm.t{00,06,12,18}z.medium_range.channel_rt_{1..6}.alaska.aprfc.nc
nwm.t{00,06,12,18}z.medium_range_no_da.channel_rt.alaska.aprfc.nc
nwm.t{00,06,12,18}z.medium_range_blend.channel_rt.alaska.aprfc.nc

```

nwm.t{00..23}z.analysis_assim.channel_rt.tm{0000,0015,...,02
45}.hawaii.aprfc.nc
nwm.t{00..23}z.analysis_assim_no_da.channel_rt.tm{0000,0015
,...,0245}.hawaii.aprfc.nc
nwm.t{00,12}z.short_range.channel_rt.aprfc.nc
nwm.t{00,12}z.short_range_no_da.channel_rt.aprfc.nc

```

```

land/
nwm.t{00..23}z.analysis_assim.land.tm{00,01,02}.alaska.aprfc.nc
nwm.t{00,06,12,18}z.short_range.land.f{001..015}.alaska.aprfc.nc
nwm.t{03,09,15,21}z.short_range.land.f{001..045}.alaska.aprfc.nc

```

```

nwm.t{00..23}z.analysis_assim.land.tm{0000,0100,0200}.aprfc.nc
nwm.t{00,12}z.short_range.land.f{00100..04800}.aprfc.nc

```

```

forcing/
nwm.t{00..23}z.analysis_assim.forcing.tm{00,01,02}.alaska.aprfc.nc
nwm.t20z.analysis_assim_extend.forcing.tm{00..31}.alaska.aprfc.nc
nwm.t{00,06,12,18}z.short_range.forcing.f{001..015}.alaska.aprfc.nc
nwm.t{03,09,15,21}z.short_range.forcing.f{001..045}.alaska.aprfc.nc
nwm.t{00,06,12,18}z.medium_range.forcing.f{001..240}.alaska.aprfc.nc
nwm.t{00,06,12,18}z.medium_range_blend.forcing.f{001..240}.
alaska.aprfc.nc

```

```
nwm.t{00..23}z.analysis_assim.forcing.tm{00,01,02}.aprfc.nc
nwm.t{00,12}z.short_range.forcing.f{001..048}.aprfc.nc
```

- Puerto Rico domain files are in the SE directory.
channel_rt/
nwm.t{00..23}z.analysis_assim.channel_rt.tm{00,01,02}.puertorico.serfc.nc
nwm.t{00..23}z.analysis_assim_no_da.channel_rt.tm{00,01,02}.puertorico.serfc.nc
nwm.t{00,06,12,18}z.short_range.channel_rt.puertorico.serfc.nc
nwm.t{00,06,12,18}z.short_range_no_da.channel_rt.puertorico.serfc.nc

land/
nwm.t{00..23}z.analysis_assim.land.tm{00,01,02}.puertorico.serfc.nc
nwm.t{00,06,12,18}z.short_range.land.f{001..048}.puertorico.serfc.nc

forcing/
nwm.t{00..23}z.analysis_assim.forcing.tm{00,01,02}.puertorico.serfc.nc
nwm.t{00,06,12,18}z.short_range.forcing.f{001..048}.puertorico.serfc.nc

(D) Timing Changes

With the implementation of NWM V3.1, the timing of NWM output dissemination will change as follows (Directory/Filename):

- D1. Coastal Puerto Rico Short Range files - up to 21 minutes earlier
short_range_coastal_puertorico/nwm.*.total_water.f*.puertorico.nc
short_range_coastal_puertorico/nwm.*.total_water.puertorico.shcf
- D2. Coastal Atlgulf Short Range files - up to 6 minutes earlier
short_range_coastal_atlgulf/nwm.*.total_water.f*.atlgulf.nc
short_range_coastal_atlgulf/nwm.*.total_water.atlgulf.shcf
- D3. Coastal Atlgulf Medium Range files - up to 325 minutes earlier
medium_range_coastal_atlgulf_mem1/nwm.*.total_water.f*.atlgulf.nc
medium_range_coastal_atlgulf_mem1/nwm.*.total_water.atlgulf.shcf
- D4. Coastal Pacific Medium Range files - up to 145 minutes earlier
medium_range_coastal_pacific_mem1/nwm.*.total_water.f*.pacific.nc
medium_range_coastal_pacific_mem1/nwm.*.total_water.pacific.shcf
- D5. Hawaii Short Range forecast files - up to 7 minutes earlier
short_range_hawaii/nwm.*.{channel_rt,terrain_rt,land,reservoir}.f*.hawaii.nc
- D6. Alaska Medium Range forecast files - up to 6 minutes earlier
medium_range_alaska_mem*/nwm.*.{channel_rt,terrain_rt,land,reservoir}.f*.alaska.nc
- D7. Alaska Blend Medium Range forecast files - up to 6 minutes

earlier

```
medium_range_blend_alaska/nwm.*.{channel_rt,terrain_rt,land
,reservoir}.f*.alaska.nc
```

D8. Conus Long Range forecast files - up to 10 minutes earlier

```
long_range_mem*/nwm.*.{channel_rt,terrain_rt,land,reservoir
}.f*.conus.nc
```

(E) OWP Water Website visualization services

End users are able to visualize several NWM outputs via the interactive map and image viewer on the Office of Water Prediction (OWP) website:

<https://water.noaa.gov/>

(F) Other information and contacts

As in V3.1, users will find that long range products have enough of a lag time in creation that they may appear in the previous day's output directory. For example, long range mem 1 products for the 18z cycle will not show up until the day after their initialization time. For this reason, users are encouraged to look back in the previous dated directory for long range product availability.

Most NWM NetCDF output files are directly viewable using standard NetCDF visualization utilities. The exception are the point-type NWM channel output files containing streamflow and other variables. In particular, due to storage space limitations, the latitude and longitude of each point are stored outside of the file, but are available at:

https://www.nohrsc.noaa.gov/pub/staff/keicher/NWM_live/web/data_tools/NWM_channel_hydrofabric.tar.gz

This archive contains an ESRI file geodatabase (gdb), which provides full geospatial information for all NWM stream reaches. The gdb file can easily be used with ESRI ArcGIS software, and other GIS software, to associate the correct geospatial data with NWM channel_rt data by feature_id. A full text description of the gdb contents and basic use instructions are available as a separate file in the archive.

A consistent parallel feed of NWM model data will be available on the NWS servers via the following URLs:

<https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm/para>

And here for the parallel post-processed data:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm/para/nwm.YYYYMMDD/post_processed/

NWS encourages all users to ensure their decoders are flexible and are able to adequately handle changes in content order and also any volume changes which may be forthcoming. These elements may change with future NWS model implementations. The NWS will make every attempt to alert users to these changes prior to any implementations.

Any questions regarding this implementation should be directed below. We will evaluate any feedback and decide whether to proceed.

For questions on the science aspects of the NWM or post-processing derived variables and general product format and processing, please contact:

Brian Cosgrove
OWP/Service Development Division (S2D)
Silver Spring, MD
brian.cosgrove@noaa.gov

For questions regarding the data flow aspects of the model data, please contact:

Margaret Curtis
NWS Dataflow Team Lead
ncep.pmb.dataflow@noaa.gov

APPENDICES

Appendix 1, Hydrofabric Changes.

A1.1) Flow path changes

The "to" variable has changed in the RouteLink_CONUS.nc files for some locations and are mapped from NWMv3.0 to NWMv3.1 in the list below. Where this occurs, the flow path has changed, impacting downstream locations.

NWMv3.1 ReachID	<>	NWMv3.0 ReachID
5279236	<>	5279226
1566046	<>	1566048
5279242	<>	5279236
5279242	<>	5279226
5279236	<>	5279240
5279226	<>	5279240
13437921	<>	13438395
17540557	<>	17540339

A1.2) Dropped Gauges

Gauge 04216000 has been dropped from NWMv3.0

A1.3) Added Gauges

The following provides a list of gauges that have been added to the Routelink v3.1:

08042515
08077110
08077670
08189520
08041970
08111006
08070550
08077640

08117375
08031020
08078400
08163880
08068020
08042455
08067520
08189718
08111051
08162580
08098295
08111085
08068025
08070900
08117857
08169778
08111090
08110520
08189590
08108710
08111080
08164150
08164200
08180990
08065080
08066380
08163720
08164410
08065420
08042539
08076990
08065340
08066138
08070220
08117858
08097000
08108705
08111056
08163900
08066087
08067280
08078890
08064990
08109310
08031005
08042468
08041940
08077888
08117403
08111110
08042470
08067505
08041788
08041945

08065925
08065700
08065820
08078910
08189298
08100950
08173210
08189320
08078935
08065310
08067653
08102730
08111070
08041790
08030530
08067000
06659500
02HA013

A1.4) Gauge Changes

- The link for gauge "02CD006" has changed from "41011866" to "41011791" in the RouteLink file.
- Gauge "02HA013" listed as new in section A1.3 is replacing gauge "04216000" previously used in NWMv3.0.
- Four gauges were corrected as shown in the following table:

NWS_LID	GAGE_ID	Correct_REACH_ID
ATOK1	07166500	20955128
IOLK1	07183000	20897397
GCBG1	02191227	6278163
KLMC1	11530500	4440630

Appendix 2, New NWM Coastal Total Water Level Output. Note: The tables in the link below show the columns labeled "Data type", "Parameter", "Long Name", and "Units".

- Coastal Psurge Short-Range Puerto Rico Files: List of Coastal output variables listed here:

<https://www.nco.ncep.noaa.gov/pmb/products/nwm/>

NWS National Service Change Notices are online at:

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

NNNN