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PNSWSH

Service Change Notice 19-38
National Weather Service Headquarters Silver Spring MD
955 AM EDT Mon May 6 2019

To: Subscribers:
           -NOAA Weather Wire Service
           -Emergency Managers Weather Information Network
           -NOAAPORT
           Other NWS Partners, Users and Employees

From: Bob Maxson
           Acting Director
           National Centers for Environmental Prediction

Subject: HYSPLIT Model Update Effective June 12, 2019

Effective on or about Wednesday, June 12, 2019, beginning with
the 1200 Coordinated Universal Time (UTC) run, the National
Centers for Environmental Prediction (NCEP) will upgrade the
Hybrid Single Particle Lagrangian Integrated Trajectory
(HYSPLIT) modeling system that produces operational predictions
of wildfire smoke, dust from dust storms and as needed volcanic
ash converted into a format for input to HYSPLIT. Major
components include:
  - Adding High-Resolution Rapid Refresh (HRRR) Model and
removing Rapid Refresh (RAP)
  - Changing to quarter-degree hybrid-level Global Forecast
System (GFS) HYSPLIT-format meteorology from half-degree
  - Adding volcano trajectories to NCEP Web Services

Science Upgrades:

For volcanic ash, added the option to use the Ganser fall
velocity algorithm, which can have a slight impact on the
largest ash particles. No scientific enhancements to the smoke
and dust products were made.

Output changes:

The HYSPLIT is available on both the NWS and NCEP Web Services.
There are no changes to the CONUS, Alaska and Hawaii output on
the NWS Web Services here:

ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.aq
https://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.aq

The following changes will be applied to data on the NCEP Web Services here:
https://nomads.ncep.noaa.gov/pub/data/nccf/com/hysplit/prod/
ftp://ftpprd.ncep.noaa.gov/pub/data/nccf/com/hysplit/prod

1. Add HRRR sigma-level forecasts formatted for HYSPLIT, with filename convention:
    hysplit.tCCz.hrrrf00 – forecast hours 0-5
    hysplit.tCCz.hrrrf06 – forecast hours 6-11
    hysplit.tCCz.hrrrf12 – forecast hours 12-17
    hysplit.tCCz.hrrrf18 – forecast hour 18,
where CC = cycle hour (00,01,...,22,23)

2. Replace the half-degree resolution hybrid-level GFS file formatted for HYSPLIT with a quarter-degree resolution file
Remove:
    hysplit.tCCz.gfs0p5f
Add:
    hysplit.tCCz.gfs0p25f000, forecast hours 0-21
    hysplit.tCCz.gfs0p25f024, forecast hours 24-45
    hysplit.tCCz.gfs0p25f048, forecast hours 48-69
    hysplit.tCCz.gfs0p25f072, forecast hours 72-84
where CC = cycle hour (00,06,12,18)

3. Change of fields in the quarter-degree hybrid-level GFS file formatted for HYSPLIT
Add:
    surface height (SHGT)
    relative humidity on hybrid levels (RELH)
    pressure vertical velocity (WWND)
    total accumulated precipitation (TPPA)
Remove:
    specific humidity on hybrid levels (SPHU)
    6-hour accumulated precipitation (TPP6)

Note that vertical velocity was removed from the then half-degree HYSPLIT-formatted GFS hybrid-level file in July 2017 with the GFS upgrade to v14.0. Coincident with the GFS v15.1

upgrade, the post-processing enables vertical velocity in the
HYSPLIT-formatted quarter-degree files.

4. Change a field in the one-degree GFS files formatted for
HYSPLIT:
    hysplit.tCCz.gfs[f|a]
where CC = cycle hour (00,06,12,18)

Remove: 6-hour accumulated precipitation (TPP6)
Add: total accumulated precipitation (TPPA)

5. Change of fields in the NAM hybrid-level HYSPLIT-formatted
files:
    hysplit.tCCz.nams[f|a]
    hysplit.tCCz.nams[f|a].AK
    hysplit.tCCz.nams[f|a].HI
    hysplit.tCCz.namsf??.CONUS
    hysplit.tCCz.namsf.FW
where CC = cycle hour (00,06,12,18)

Add: convective available potential energy (CAPE)
Remove: low, middle, and high cloud cover (LCLD, MCLD, HCLD)

6. Remove RAP pressure-level forecasts formatted for HYSPLIT.
Users should begin using the HRRR output as a replacement:
    hysplit.tCCz.rap[f|a]

7. Remove NAM 12 km regional tiles which were extracted from
    hysplit.tCCz.namsf:
    hysplit.tCCz.namsf.NEtile
    hysplit.tCCz.namsf.SEtile
    hysplit.tCCz.namsf.SWtile
    hysplit.tCCz.namsf.NWtile
where CC = cycle hour (00,06,12,18)

- Begin disseminating volcano trajectory files in the following
formats: gif, kmz and txt
The trajectories have a duration of 6 hours and begin 6, 12, 18
and 24-h into the forecast. Products will be available under the
hysplit directory on the NCEP Web services.
    Sub-directory: /traj.YYYYMMDD/
where YYYYMMDD is: 4 digit year, 2 digit month and two digit day
    Files: hysplit.CCz.traj.volc[N|NN].fHHH.[gif|kmz|txt]
where CC is cycle hour (00,06,12,18), N, NN is an integer from
1 to 34 that identifies the volcano and HHH is 006,012,018,024

The text file that associates the volcano name with the N, NN integer is:

    hysplit.tCCz.traj.volc[N|NN].txt

Users are encouraged to always read the volcano filename file because volcanoes may be added and the N, NN integer for a given volcano may change at any time.

8. The following will have product output timing changes

- The following will be available 10-15 minutes earlier:
    hysplit.tCCz.gfsa
    hysplit.tCCz.gfsf
    hysplit.tCCz.namsf??.CONUS

- The long-range products will be up to 20 minutes later:
    hysplit.tCCz.gfslrf

- The new quarter-degree GFS files are generated 15 minutes later than the half-degree due to the increased resolution and GFS FV3 files.

More details about the HYSPLIT are available at:
  https://www.ready.noaa.gov/HYSPLIT.php

Operational graphical display for smoke and dust at:
  https://airquality.weather.gov/

Operational display for volcanic ash at:
  https://tgftp.nws.noaa.gov/fax/wafsash.shtml

Users can find output from the updated HYSPLIT model available through a parallel feed:
  https://para.nomads.ncep.noaa.gov
  https://www.emc.ncep.noaa.gov/mmb/aq/hysplit/web/html/

NCEP will evaluate any comments and decide whether to proceed. For questions regarding these updated predictions, please contact:

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NWS Service Change Notices are online at:

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

NNNN