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Service Change Notice 22-106
National Weather Service Headquarters Silver Spring MD
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To: Subscribers:
           -NOAA Weather Wire Service
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From: Michael Farrar, Director
           National Centers for Environmental Prediction

Subject: Upgrade to HYSPLIT v8.0 to Provide Volcanic Ash Ensemble
         Predictions, HREF and GEFS Coupling to HYSPLIT and Time of
         Arrival Graphics for Radiological Release, Effective December 6,
         2022

On December 6, 2022, the HYbrid Single Particle Lagrangian Integrated
Trajectory (HYSPLIT) transport and dispersion model V7.8 will be upgraded
to version 8.0. In the case of a Critical Weather Day or declaration of
Enhanced Caution status, this upgrade may be delayed to the next business
day. This version includes the following upgrades and bug fixes:

- Update to the latest version of NOAA Air Resources Laboratory
(ARL)HYSPLIT model codes. The highlights of HYSPLIT upgrades:

* Science updates:
  - Improved initialization of turbulent velocity
  - Set a minimum value for roughness length
  - New plume rise algorithm added
  - New options for computing Lagrangian time scale
  - New convective schemes
  - Minimum mixed layer depth changed from 0 to 25 m

* Technical updates:
  - Added ability for circular emissions area
  - Plotting updates (gridplot, trajplot, concplot, volcplot) - new
algorithm for determining spatial extent
  - Cleaning of code including removing unused variables and fixing
uninitialized variables

- Inclusion of an ensemble dispersion capability to predict and quantify
Volcanic Ash plume uncertainty using the 31 member NWS Global Ensemble
Forecast Capability (GEFS) v12 to drive the dispersion.

- Creation of ARL-Packed format High Resolution Ensemble Forecast (HREF)
10 member predictions input files to drive HYSPLIT hazardous release
ensemble predictions. These input files for HYSPLIT will be available on
the NWS Web Operation Center (WOC) server (password protected).

- Creation of a Time of Arrival graphic for radiological plume prediction as requested by the World Meteorological Organization (WMO) Regional Specialized Meteorological Center (RSMC) Expert Team on Emergency Response Activities (ET-ERA).

The proposed changes in model forecast output, post-processed fields and downstream products are as follows:

- Existing File names will remain unchanged.
- No increase in data volume on NWS Public servers.
- HYSPLIT volcanic ash output plots and NETCdf files should be put on FTPS-Out and sent to Volcanic Ash Advisory Center (VAAC) and Senior Duty Meteorologist (SDM) via DBNet Alert procedures.

Disclaimer: The National Centers for Environmental Prediction (NCEP) encourages all users to ensure their decoders are flexible and are able to adequately handle changes in content order, parameter fields changing order, changes in the scaling factor component within the Product Definition Section (PDS) of the gridded binary (GRIB) files, and also any volume changes which 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 implementation.

Send any comments on the science aspects of this upgrade to:

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For questions on the dataflow aspects, please contact:

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