NOUS41 KWBC 151550
PNSWSH

Public Information Statement 26-29
National Weather Service Headquarters Silver Spring MD
1150 AM EDT Wed Apr 15 2026

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

From: Fanglin Yang
Chief, Physics and Dynamics Division
Acting Chief, Coupled Modeling Division
NCEP/Environmental Modeling Center

Subject: Soliciting Public Comments through May 15, 2026 on the Proposed Upgrade to the Global Forecast System

The Environmental Modeling Center (EMC) is proposing to upgrade the NWS operational Global Forecast System (GFS) and Global Data Assimilation System (GDAS) from v16 to v17 in October 2026. This upgrade will transition the system to a fully coupled Earth-system modeling framework for global weather prediction, improved model forecast performance, and expanded, enhanced products that cover all components of the Earth system. The NWS is seeking comments on the proposed changes to GFSv17 through May 15, 2026.

GFSv17 introduces a coupled Earth-system model with components of the atmosphere, land, ocean, sea ice, and waves. Proposed changes to the GFSv17 include:

- An increased horizontal resolution from C768 (13 km) to C1152 (9 km)using the Finite-Volume Cubed-Sphere (FV3) dynamic core.
- Introduction of fractional grids along oceanic coastlines.
- Improved atmospheric and land surface parameterization schemes, including:
  (i) revisions to convection triggering, convective rain evaporation, downdraft detrainment, and improved separation between deep and shallow convection to reduce biases and improve CAPE forecasts. Additional advancements include a new prognostic convective updraft fraction parameterization that improves MJO prediction, stochastic convective initiation and organization using cellular automata, and incorporation of the positive-definite mass-flux transport and tracer treatment to remove negative tracer mixing ratios;
  (ii) a new parameterization of environmental wind shear and revised planetary boundary layer and convection interaction to improve hurricane intensity forecasts and modification of the background diffusivity profile to better represent surface inversions;
  (iii) implementation of a new sea spray parameterization, along with updates to momentum roughness over the ocean, thermal roughness over

land, and the maximum stability limit to enhance surface flux representation;

(iv) replacement of the one-moment GFDL cloud microphysics scheme with the hybrid two-moment Thompson-Eidhammer cloud microphysics scheme. This scheme was further enhanced to better represent supercooled liquid clouds and precipitation. In addition, a semi-Lagrangian sedimentation scheme for hydrometeors was introduced to improve numerical stability when running the Thompson-Eidhammer cloud microphysics with large time steps;

(v) improvements to the Rapid Radiative Transfer Model for GCMs (RRTMG) radiation, including the introduction of a new Modern-Era Retrospective analysis for Research and Applications Version 2 (MERRA-2) aerosol climatology, updated cloud-radiation interaction, and refinements to address excessive net shortwave radiation to the ocean at low sun angles;

(vi) replacement of the Noah Land Surface Model (LSM) with the Noah Land Surface Model with Multi-Parameterization (Noah-MP);

(vii) Updates and unification of orographic and non-orographic gravity wave drag (GWD) parameterizations and mountain blocking effects, along with the introduction of turbulent orographic form drag;

(viii) introduction of fractional grid compositing of albedo and emissivity to improve atmosphere-land coupling stability and consistency along coastlines; and

- Introduction of the Modular Ocean Model (MOM6) on a quarter-degree tripolar grid for the ocean component.
- Introduction of the Community Ice CodE (CICE6) model on a quarter-degree tripolar grid for the sea ice component.
- Continued use of the WAVEWATCH III model for the wave component while introducing an unstructured grid. The wave component will receive ice and current as inputs through the coupled system and provide feedback to the atmosphere and ocean components.
- Continued use of the Unified Forecast System weather model as the overall framework for all coupled earth system components.
- Introduction of the Community Mediator for Earth Prediction Systems (CMEPS) for coupling between earth system components, with continued use of the National Unified Operational Prediction Capability (NUOPC) Layer of the Earth System Modeling Framework (ESMF). These efforts benefitted from collaboration with NOAA/GFDL, NCAR, and NASA.
- Optimization of the computational performance of the fully coupled application.
- Advancement of the Global Workflow, an end-to-end portable system designed to run the fully coupled UFS Earth-system model for deterministic and ensemble applications across scales, including GFSV17 for medium-range weather prediction.

GDASv17 will introduce new data assimilation components to provide initial conditions for the new modeling components. These new data assimilation algorithms will use the Joint Effort for Data assimilation Integration (JEDI) framework. Proposed changes to the GDASv17 include:

- Upgrade of the GSI-based Hybrid 4DEnVar atmospheric data assimilation scheme to a multi-scale algorithm with scale-dependent localization.
- Replacement of the Global Land Data Assimilation System (GLDAS) with a soil temperature and soil moisture analysis as part of the existing GSI-based atmospheric Local Ensemble Transform Kalman Filter (LETKF).

Observations assimilated are screen-level temperature and moisture observations.
- Introduction of snow data assimilation using a 2DVar algorithm within the JEDI framework. Observations assimilated are station observations of snow depth and Snow and Ice Mapping System (IMS) snow cover observations.
- Introduction of ocean and sea ice data assimilation using a JEDI-based 3DVar-FGAT algorithm. Observations assimilated are along-track sea surface height from Jason-3, Sentinel-6 Michael Freilich, SARAL/AltiKa, and CryoSat-2; sea surface temperature from VIIRS instruments on Suomi-NPP, NOAA-20, and NOAA-21 and AVHRR instruments on NOAA-18, NOAA-19, MetOp-B, and MetOp-C; sea ice concentration from the AMSR2 passive microwave sensor on GCOM-W1; and in-situ temperature and salinity observations from Argo floats and surface drifters.

As a result of the expanded products in GFSv17 some of the existing products will be discontinued. We will issue a separate public notice on product removals associated with the GFSv17 upgrade.

Significant folder directory structure and name changes are planned to help improve organization and clarity of files as we add more components. Details will be shared in a service change notice before implementation.

The NWS will evaluate all comments to determine whether to proceed with the proposed upgrade. If approved, a Service Change Notice will be issued 30 days before the model implementation date. Please submit comments and questions on the proposed GFSv17 upgrade to:

Email: gfs.feedback@noaa.gov

Google Form: Soliciting Comments on the Proposed Upgrade to the Global Forecast System

For questions regarding the data flow aspects, please contact:

Margaret Curtis
NWS Central Operations Dataflow Team Lead
College Park, MD
ncep.pmb.dataflow@noaa.gov

National Public Information Statements are online at:

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

NNNN