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Public Information Statement 26-07
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From: Dr. Fanglin Yang
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Subject: Soliciting Comments through February 28, 2026 on the Proposed Replacement of GEFS Aerosol Products with the Global Chemistry and Aerosol Forecast System (GCAFS) version 1.0.

The Environmental Modeling Center (EMC) is soliciting comments through February 28, 2026 on the proposed implementation of the Global Chemistry and Aerosol Forecast System (GCAFS) version 1.0 with the purpose of improving predictions of dust, sea salt, smoke from wildfires, and other particles in the atmosphere that can impact visibility or human health replacing the current capability of the Global Ensemble Forecast System (GEFS). Alongside GCAFS version 1.0 comes the Global Constituent Data Assimilation System (GCDAS) which provides analyses of aerosol species to initialize the GCAFS forecasts using the next-generation assimilation software, the Joint Effort for Data assimilation Integration (JEDI). GCAFS v1.0 will instead provide a 5-day GCAFS forecast with 3-hourly output for the 00 and 12 UTC cycles. A new analysis, the Global Constituent Data Assimilation System (GCDAS), will provide analyses of aerosol species at the 00, 06, 12, and 18 UTC cycles to initialize the GCAFS forecasts, providing products valid at initialization time only.

The implementation of GCAFS v1.0 is intended to separate and transition the existing aerosol modeling capability from the current operational Global Ensemble Forecast System (GEFS) version 12, while maintaining continuity of the publicly available products, by introducing the following changes:

- Doubling of the model vertical resolution from 64 layers to 127 layers to match the vertical resolution of the Global Forecast System (GFS), which provides medium-range weather forecasts
- Updates to the fengsha dust emissions scheme, large scale wet scavenging, and settling velocity
- Updated chemical mechanism to the GOCART2G aerosol model
- Upgrades to the biogenic and anthropogenic emissions datasets and processing to the Community Emissions Data System (CEDS) 2022 base version
- Assimilation of Visible Infrared Imaging Radiometer Suite (VIIRS) Aerosol Optical Depth (AOD) retrievals provided by

NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) in a 3D-Variational analysis four times per day using JEDI

The proposed GCAFSv1.0 implementation will be accompanied by the retirement of the GEFS v12 aerosol product as described in the Public Information Statement 25-52: https://www.weather.gov/media/notification/pdf_2025/pns25-52_soliciting_comments_gefs_aerosol_termination.pdf .

More information on the products provided by GCAFS v1.0 can be found at the following link: https://www.weather.gov/media/notification/ref/GCAFS_v1_Products_Supplemental.pdf

Please submit comments, questions, or requests on the proposed GCAFSv1 implementation to:

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National Public Information Statements are online at: https://www.weather.gov/notification

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