
NCEP Operational Global Data Assimilation System (GDAS): Recent Upgrades and Future Plans

Daryl Kleist*^{†1}, Russ Treadon¹, Catherine Thomas¹, Haixia Liu^{1,2}, Emily Liu¹, and Rahul Mahajan¹

¹Environmental Modeling Center, NOAA National Centers for Environmental Prediction – 5830 University Research Court, College Park, MD 20740, United States

²IMSG – 5830 University Research Ct. College Park, MD, United States

Abstract

The Global Forecast System (GFS) and GDAS were recently updated to version 16. This included a doubling of the number of vertical layers in the model and raising the model top to ~ 80 km. The data assimilation system continues to utilize hybrid 4D-EnVar within the Gridpoint Statistical Interpolation (GSI). Additional changes included replacing the Ensemble Serial Filter with the Local Ensemble Transform Kalman Filter (LETKF) for the ensemble perturbation update, 4D incremental analysis update (IAU), improvements to the inline sea surface temperature analysis, and semi-coupled land analysis as forced by observed precipitation. Additional changes included calibration to account for the new model layer specification, changes to stratospheric humidity increments, satellite channel selection to include higher peaking channels from ATMS and AMSU-A, bias correction, the use of inter-channel correlated observation errors for IASI and CrIS, and incorporation of additional clear-sky radiance data from geostationary satellites.

Work is underway on future upgrades to include improved use of observations such as the utilization of commercial GPS radio occultation, additional atmospheric motion vectors, new sensors for constraining sea surface temperature, antenna corrected radiances, and updates to the use of scatterometer winds.

This presentation will provide details regarding the upgrades included in version 16 as well as preliminary results from the upcoming changes related to improved use of observations. Progress and plans on the transition from GSI to the Joint Effort for Data assimilation Integration will be discussed. Finally, plans for coupled assimilation as part of the Unified Forecast System and GFSv17 will be presented.

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*Speaker

[†]Corresponding author: daryl.kleist@noaa.gov