

The Weather Company's Global High-Resolution Atmospheric Forecasting (GRAF) System: Migration to JEDI for Cycled Data Assimilation

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The Weather Company's (TWC) Global High-Resolution Atmospheric Forecasting (GRAF) System, which utilizes the NCAR Model for Prediction Across Scales (MPAS), has undergone a significant HPC expansion and unification of its multiple (15-hour and 72-hour) applications. With 210 compute nodes (840 GPUs), the TWC unified weather prediction system is running high-resolution, convective-allowing, and hourly-updating global 72-hour forecasts to drive its short-term weather forecast platforms and applications.

Data assimilation (DA) is playing an integral role for next-generation GRAF, with a transition from a partially-cycled GSI (Gridpoint Statistical Interpolation) approach to a fully-cycled, rapidly-updating JEDI (Joint Effort for Data assimilation Integration) implementation. The TWC JEDI development efforts will progress from 3DVar to Hybrid 3D- and 4D-EnVar, using a wide range of observation datasets such as radar, satellite, conventional, and TWC proprietary sources. The ensemble component of the hybrid DA approach will be based on an in-house MPAS configuration. Current work has been related to (i) generating a 12-km background error covariance matrix based on 5 months of retrospective GRAF forecasts out to 48 hours and (ii) automating a JEDI-based workflow using GPU MPAS, as part of a joint collaboration with NCAR.

The presentation will provide an overview of the GRAF configuration and expansion, ongoing JEDI DA, and the implications of AI for GRAF.