



## **The Development of the next generation NCEP Global Ensemble Forecast System (GEFS)**

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The Next Generation Global Prediction System (NGGPS) initiative, started in 2015, has led to an envisioned community-based Unified Forecast System (UFS) that will have a National Weather Service (NWS) operational model running at the National Centers for Environmental Prediction (NCEP). As the first operational part of the UFS, the deterministic Global Forecast System (GFS) will be upgraded in early 2019 and the corresponding ensemble system, the NCEP Global Ensemble Forecast System (GEFS) will be upgraded from the current operation version (v11) to a new version (v12) later in 2019.

In contrast to the operational GEFS (v11), GEFS v12 will be significantly changed in the following ways: 1). The dynamic core will be switched from spectral to Finite-Volume Cubed-Sphere (FV3) representation; 2). Model horizontal resolution will be increased from 34 km (0-8 days), and 55 km (8-16 days) to 25 km (0-16 days); 3). GFDL microphysics scheme will replace the currently-operational Zhao-Carr scheme; 4). Forecast length will be extended from 16 to 35 days to cover subseasonal prediction. In addition, scientific enhancements include new stochastic schemes (SKEB and SPPT – replacing STTP), a so-called 2-tiered representation of SSTs, and a scale-aware convection parameterization, all of which enhance prediction skills of weather and in the weeks 3&4 time scale. In particular, probabilistic quantitative precipitation forecast (PQPF) has improved significantly in addition to the improvement of large scale pattern. The new results will be presented from nearly 2-year retrospective experiments.