NASA SPoRT Modeling and Data Assimilation Research and Transition Activities using WRF, LIS, and GSI

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The NASA Short-term Prediction Research and Transition (SPoRT) program has numerous modeling and data assimilation (DA) activities in which the WRF model is a key component. SPoRT generates real-time, research satellite products from the MODIS and VIIRS instruments, making the data available to NOAA/NWS partners running the WRF/EMS, including: (1) 2-km northwestern-hemispheric SST composite, (2) daily, MODIS green vegetation fraction (GVF) over CONUS, and (3) NASA Land Information System (LIS) runs of the Noah LSM over the southeastern CONUS. Each of these datasets have been utilized by specific SPoRT partners in local EMS model runs, with select offices evaluating the impacts using a set of automated scripts developed by SPoRT that manage data acquisition and run the NCAR Model Evaluation Tools verification package.

SPoRT is engaged in DA research with the Gridpoint Statistical Interpolation (GSI) and Ensemble Kalman Filter in LIS for soil moisture DA. Ongoing DA projects using GSI include comparing the impacts of assimilating Atmospheric Infrared Sounder (AIRS) radiances versus retrieved profiles, and an analysis of extra-tropical cyclones with intense non-convective winds. As part of its Early Adopter activities for the NASA Soil Moisture Active Passive (SMAP) mission, SPoRT is conducting bias correction and soil moisture DA within LIS to improve simulations using the NASA Unified-WRF (NU-WRF) for both the European Space Agency's Soil Moisture Ocean Salinity and upcoming SMAP mission data. SPoRT has also incorporated real-time global GVF data into LIS and WRF from the VIIRS product being developed by NOAA/NESDIS. This poster will highlight the research and transition activities SPoRT conducts using WRF, NU-WRF, EMS, LIS, and GSI.