

Utilizing the SPoRT MET Scripts to Assess the WRF EMS for a Southeast Texas Heavy Rainfall Event

Patrick Blood and Lance Wood
NWS Houston/Galveston

Using the Weather Research and Forecasting Environmental Modeling System (WRF EMS), a set of historical model runs are created by varying the initialization dataset, microphysical scheme, and planetary boundary layer. These variations yield a total of 144 unique model runs to examine, with the goal of finding the best combination of the above mentioned parameters, to optimize the WRF EMS for southeast Texas, cold season, heavy rainfall events. The heavy rainfall case of interest occurred on April 18th 2009. This case produced some of the highest 1 to 6 hourly rainfall rates observed in southeast Texas. The extreme rainfall was forced by an approaching upper level trough, a slow moving frontal boundary, and a mesoscale surface low. These features combined with an unstable and very moist atmosphere to produce significant flooding across areas just inland from the coast, and south of Houston.

Precipitation statistics derived from the Model Evaluation Tools (MET) software package are shown for the best performing WRF EMS runs. The latest version of the SPoRT MET scripts are used to interact with MET and provide the gridded statistical analysis by comparing stage IV precipitation to the WRF EMS precipitation field. We hope to show how beneficial the SPoRT MET scripts can be to a NWS field office, by objectively evaluating and ultimately optimizing a local WRF EMS model for a significant forecast problem.