The Experimental Regional Ensemble Forecast System (ExREF): Its Use in NWS Forecast Operations and Preliminary Verification

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The Experimental Regional Ensemble Forecast (ExREF) system is a tool for the development and testing of new Numerical Weather Prediction (NWP) methodologies. ExREF is run in near-realtime by the Global Systems Division (GSD) of the NOAA Earth System Research Laboratory (ESRL) and its products are made available through a website, an ftp site, and via the Unidata Local Data Manager (LDM).

The ExREF domain covers most of North America and has 9-km horizontal grid spacing. The ensemble has eight members, all employing WRF-ARW. The ensemble uses a variety of initial conditions from LAPS and the Global Forecasting System (GFS) and multiple boundary conditions from the GFS ensemble. Additionally, a diversity of physical parameterizations is used to increase ensemble spread and to account for the uncertainty in forecasting extreme precipitation events.

ExREF has been a component of the Hydrometeorology Testbed (HMT) NWP suite in the 2012-2013 and 2013-2014 winters. A smaller domain covering just the West Coast was created to minimize band-width consumption for the NWS. This smaller domain has and is being distributed to the National Weather Service (NWS) Weather Forecast Office and California Nevada River Forecast Center in Sacramento, California, where it is ingested into the Advanced Weather Interactive Processing System (AWIPS I and II) to provide guidance on the forecasting of extreme precipitation events. This paper will review the cooperative effort employed by NOAA ESRL, NASA SPoRT (Short-term Prediction Research and Transition Center), and the NWS to facilitate the ingest and display of ExREF data utilizing the AWIPS I and II D2D and GFE (Graphical Software Editor) software. Within GFE is a very useful verification software package called BoiVer that allows the NWS to utilize the River Forecast Center's 4 km gridded QPE to compare with all operational NWP models 6-hr QPF along with the ExREF mean 6-hr QPF so the forecasters can build confidence in the use of the ExREF in preparing their rainfall forecasts. Preliminary results will be presented.