In April, 2013, NCEP’s Weather Prediction Center (WPC) began issuing short-term Mesoscale Precipitation Discussions (MPDs) via its newly designated MetWatch Desk. MPDs are event-driven forecasts that highlight regions where heavy rainfall may lead to flash flooding in the next 1-6 hours. In support of this new function, the Hydrometeorological Testbed at WPC (HMT-WPC) conducted the Flash Flood and Intense Rainfall Experiment (FFaIR) from 8-26 July 2013. A collaboration with NOAA’s National Severe Storms Laboratory (NSSL), Earth Systems Research Laboratory (ESRL) and the Hydrometeorology Testbed Southeast (HMT-SE), FFaIR brought together 26 forecasters, researchers, and model developers, including 8 participating remotely, to explore the challenges associated with short-term QPF and flash flood forecasting during the warm season.

The main experimental forecast tool evaluated was the concept of ‘neighborhood probabilities,’ which were tested to explore the applicability of using high-resolution ensembles to quantify potential flash flood risk. Originally developed by the Storm Prediction Center (SPC) to account for the spatial uncertainty associated with high-resolution models, the neighborhood approach replaces the original parameter value of each grid point with the maximum value of the parameter occurring within a defined radius (e.g. 40 km) of the respective grid point. WPC envisions neighborhood probabilities as a potential benefit to operations in two main areas: to improve forecaster’s situational awareness on the MetWatch Desk by accounting for potential spatial uncertainty of heavy rainfall, as well as to evaluate redefining the operational excessive rainfall outlook.

In FFaIR, the neighborhood probability approach was applied to the Storm Scale Ensemble of Opportunity (SSEO) and Experimental Regional Ensemble Forecast System (ExREF) to create and evaluate various QPF probabilities, including the probability of QPF exceeding 3 and 6-hour flash flood guidance using a 20 and 40 km search radius. Results suggest that the neighborhood approach can be effective at providing helpful probabilistic flash flood guidance, particularly when using a 40 km search radius and 3-hr flash flood guidance. Subsequent results and lessons learned, as well as future plans for testing and implementing high-resolution probabilistic guidance in the upcoming 2014 FFaIR experiment, will also be discussed.