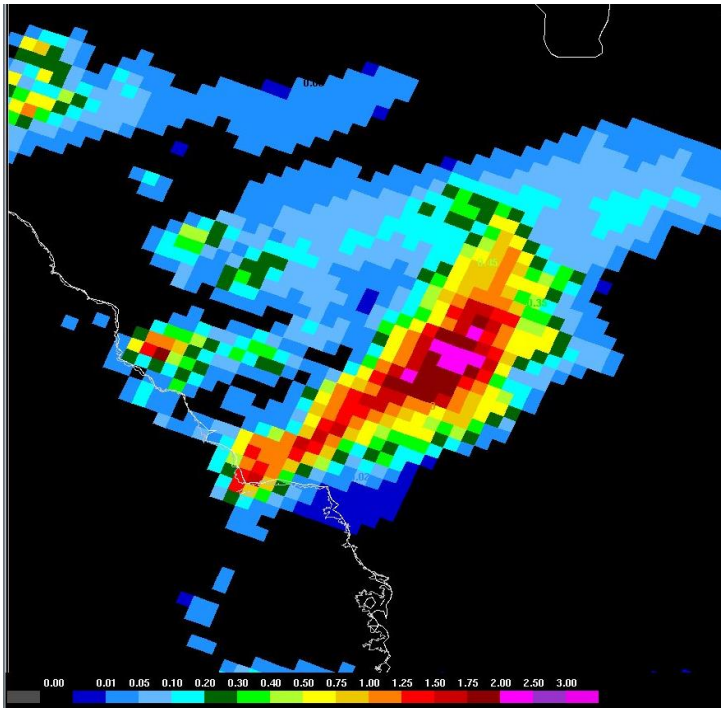
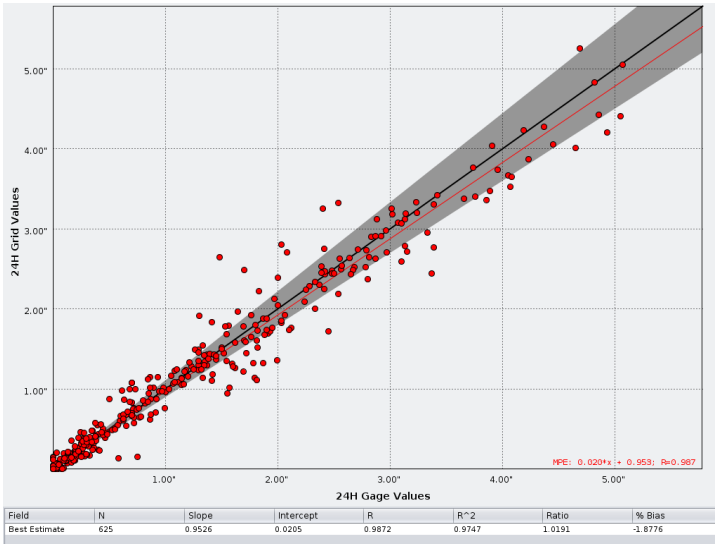
Quantitative Precipitation Estimates

Southeast River Forecast Center

01/24/2020



Example of hourly precipitation estimates



Comparison between daily rain gage reports and the associated precipitation estimates

The Southeast River Forecast Center (RFC) creates quantitative precipitation estimates for use in river forecasting. These estimates are considered “multisensor estimates” in that they are radar derived, but adjusted based on rain gage data. The estimates are on a 4x4 km grid, and while their primary use is for river forecasting operations, the grids have many users outside of the RFC.

Each hour, the National Severe Storms Laboratory provides a radar-only precipitation estimate field through their Multi-Radar/Multi-Sensor suite of products. A bias adjustment is applied to these radar estimates at Southeast RFC, using a variety of hourly rain gage networks across the Southeast. The biasing algorithm looks at a 40 km radius circle around a grid point, and if there are 10 or more non-zero gages in that circle, it calculates a ratio from the gage values and associated estimates. The grid point is then multiplied by that ratio value. If there aren’t 10 non-zero values for that hour, the algorithm will look back to previous hours until it finds 10 values. Finally, a distance weighting algorithm is applied at each gage location, adjusting the estimates to better reflect the individual gage values. This biasing from gage data happens automatically, and this derived grid is used as the Southeast RFC default field. From here, it receives manual quality control from RFC forecasters.

There are two ways in which the precipitation estimates are manually quality controlled; hourly and 24-hourly. Shortly after the top of the hour, RFC forecasters get the default field corresponding to the previous hour’s precipitation estimates. Manual adjustments are made based on the hourly automated rain gage reports, allowing the estimates to better reflect what the gages show. If there are any bad gage values, the values are removed for the hour, and the bias correction is recalculated.

Each morning, 24-hr manual rain gage reports are sent in by observers across the Southeast. These gage reports are compared to the accumulated 24-hr precipitation estimates, and additional adjustments are made to the hourly estimates. These 24-hr rain gage reports are especially important in areas where there are few hourly automated gages.