Applications of the PUSH satellite precipitation error scheme for flood monitoring

Leonardo Porcacchia (1), Viviana Maggioni (1), Mathew Sapiano (2), and Robert Adler (2)

(1) CEIE, George Mason University, Fairfax, VA, United States, (2) ESSIC, University of Maryland, College Park, MD, United States

The PUSH (Precipitation Uncertainties for Satellite Hydrology) error scheme, previously validated over Oklahoma, is now tested over a different study area at higher temporal resolution. A new product is being used for the reference precipitation: Stage IV Radar data available for the contiguous United States, at three hourly and 0.25° temporal/spatial resolution.

We focus our study on Iowa during 2009-2013 and perform a comparison with the previous work over Oklahoma. This study is a first attempt to generalize the PUSH framework to other land regions of the world. This will be of particular use in regions of the world where gauges are sparse, and satellite retrievals represent the only available precipitation estimate on which hydrological applications (e.g., flood forecasting) and water resources management can rely.

Results show the versatility of the PUSH code and its ability to reproduce the probability density function of the benchmark precipitation and its error spatial pattern.

The precipitation product, corrected by using the estimated error, is given as input to the Global Flood Monitoring System (GFMS), developed by the University of Maryland, to produce streamflow and routed runoff estimations across the study area. The model results are thus compared with the data collected during the GPM field campaign IFloodS in the spring of 2013.