Geophysical Research Abstracts
Vol. 16, EGU2014-16161, 2014
EGU General Assembly 2014

Evaluation of Satellite Rainfall Products over NASA's Iowa Flood Studies (IFloodS) Domain

Mohamed ElSaadani, Felipe Quintero, Witold F. Krajewski, Radoslaw Goska, and Bongchul Seo
IIHR—Hydroscience & Engineering, University of Iowa, Iowa City,United States, (mohamedali-elsaadani@uiowa.edu)

Iowa Flood Studies (IFloodS) is a NASA Global Precipitation Measurement (GPM) Mission to provide better understanding of the strengths and limitations of satellite products in the context of hydrologic applications. IFloodS took place in the central to north eastern part of Iowa in Midwestern United States during the months of April-June, 2013. Quantifying the physical characteristics, space/time variability and assessing satellite rainfall retrieval uncertainties at instantaneous to daily time scales are of the main objectives of IFloodS field experiment beside assessing hydrologic predictive skills as a function of space/time scales and discerning the relative roles of rainfall quantities in flood genesis.
The errors of rainfall estimation of three satellite rainfall products (TRMM's TMPA 3B42 V7, CPC's CMORPH and CHRS at UCI's PERSIANN) have been characterized in space and time using NCEP Stage IV radar-rainfall product as a benchmark for comparison. The satellite rainfall products used in this study represent 3 hourly, quarter degree, rainfall accumulation. The benchmark rainfall accumulation has an hourly, four kilometers, resolutions in time and space respectively.
We also investigate the adequacy of satellite rainfall products as inputs for hydrological modeling. To this end, these products were used as forcing for the Iowa Flood Center (IFC) hydrological model and produced discharge simulations in a high-resolution drainage network. The IFC hydrological model has been validated using radar rainfall product and thus, the hydrological outputs becomes the reference of comparison for the other rainfall products. We evaluated the hydrological performance of the rainfall products at different spatial scales, ranging from 2 to 14,000 square miles using stream discharge information from USGS gauges network. We discuss the adequacy of the rainfall products for flood forecasting at different spatial scales.