

## **Evaluation of a satellite-based near real-time global flood prediction system**

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**Abstract** This study provides an evaluation of a global flood prediction (GFS) system utilizing satellite-based rainfall and readily available geospatial data sets. The GFS, developed by our group, uses a relatively simple hydrological model, based on the runoff curve number method to transform rainfall into runoff. A grid-to-grid routing calculates the flow. Rainfall estimates are from TRMM Multi-satellite Precipitation Analysis (TMPA). An evaluation of the TMPA algorithm using a radar/gauge merged rainfall product over two basins in the southeast USA indicated that seasonal and regional considerations as well as basin size are important in using TMPA to drive hydrological models. GFS-based flood predictions were evaluated using observed streamflow data, MODIS-based inundation maps and a flood database. The GFS was able to simulate the onset of flood events produced by heavy rainfall; however, the prediction deteriorated in the later stages. This result points out the need for an improved routing component. The model showed dependency by the geographical region. A new hydrological model, with an improved physical representation and routing component is currently under development and will likely lead to improved validation results.

**Key words** satellite-based rainfall estimation; hydrological models; global flood prediction