



Decision making based on global flood forecasts and satellite-derived inundation maps in data-sparse regions

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Early flood warning and real-time monitoring systems play a key role in flood risk reduction and disaster response decisions. Global-scale flood forecasting and satellite-based flood detection systems are currently operating, however their reliability for decision making applications needs to be assessed. In this study, we performed comparative evaluations of several operational global flood forecasting and flood detection systems, using major flood events recorded over 2012-2014. Specifically, we evaluated the spatial extent and temporal characteristics of flood detections from the Global Flood Detection System (GFDS) and the Global Flood Awareness System (GloFAS). Furthermore, we compared the GFDS flood maps with those from NASA's two Moderate Resolution Imaging Spectroradiometer (MODIS) sensors. Results reveal that: 1) general agreement was found between the GFDS and MODIS flood detection systems, 2) large differences exist in the spatio-temporal characteristics of the GFDS detections and GloFAS forecasts, and 3) the quantitative validation of global flood disasters in data-sparse regions is highly challenging. Overall, the satellite remote sensing provides useful near real-time flood information that can be useful for risk management. We highlight the known limitations of global flood detection and forecasting systems, and propose ways forward to improve the reliability of large scale flood monitoring tools.