# Validation of satellite-based rainfall estimates over French Guiana for use in flood forecasting

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Floods, droughts and other water related hazards have major impacts on the socioeconomic well being of countries [1]. Implementing flood forecasting tool is vital to reduce socio-economic impacts of floods. Nevertheless such tool requires continuous efforts in many fields : river monitoring network, development of advanced forecasting techniques, data collection etc...

French Guiana unfortunately experiences extremes conditions like floods and droughts simultaneously. French Guiana is also characterized by the limited spatial coverage of ground based gauges, and unavailability of real-time rainfall data. Nowadays the availability of global coverage of satellite data offers efficient means of calculating a real rainfall estimates in sparsely gauged area. Thus, satellite-based rainfall estimates (SRE) may be one of the best and appropriate approaches to predict and forecast rainfall-induced runoff that may produce flooding.

However verification of the satellite rainfall estimation methods and products are a prerequisite to apply SRE for flood prediction. In this study, we present the analysis carried out to understand accuracy and limitations of RSE products for further use in flood forecasting in French Guiana. The other problem we address is how can SREs be adjusted for better flood prediction? Selection and verification are done by comparing the estimates against independent observed data from rain gauges. The accuracy of the SRE was evaluated using the standard verification techniques which include correlation coefficient, root mean square error (RMSE), bias, and percentage error. The approach proposed to adjust the SRE is based on bias correction methods.
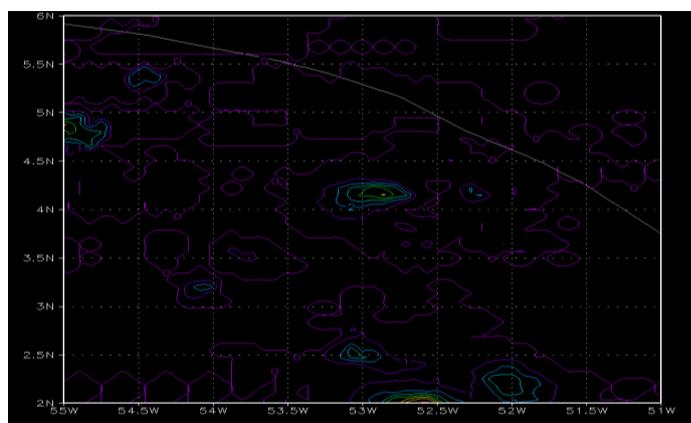
Rainfall on day 15 June 2012, over French Guiana. CMORPH; cell :~ 0.07 ° lat lon.

At the end GSMaP_MVK, GSMaP_NRT and CMORPH satellite rainfall products were selected among available products. One of the objectives of this research is to evaluate the suitability of SRE products for flood prediction in French Guiana.
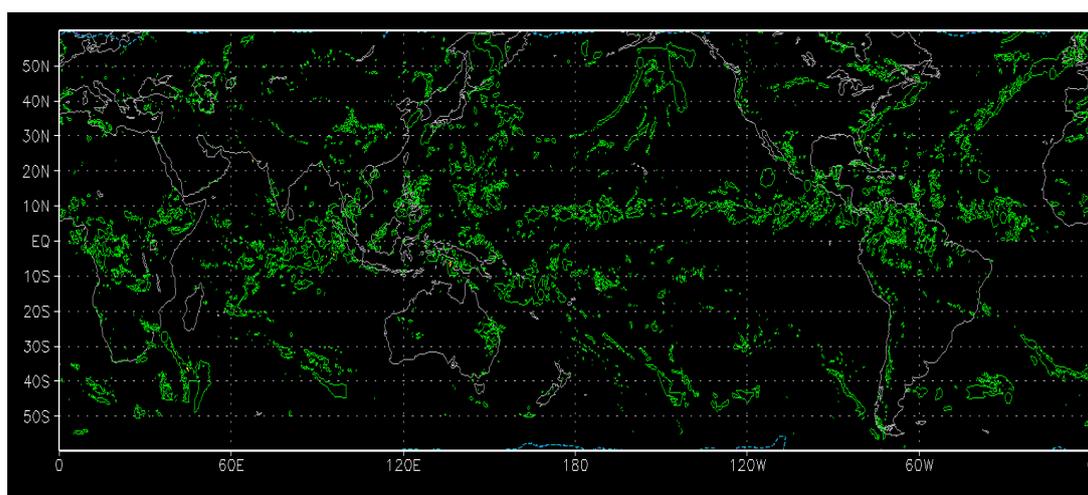
GSMaP_NRT global observation of precipitation, 10 November 10, 2008 at 0h 00, cell : 0.25° lat, lon

[1] United Nations-Water series; VOL. 1, Water Hazard risks, http://www.unwater.org/downloads/unwaterseries.pdf