

## Satellite-based Rainfall for Water Resources Application

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Rainfall is an important input to hydrological models. The accuracy of hydrological studies for water resources and floods management depend primarily on the estimation of rainfall. Thailand is among the countries that have regularly affected by floods. Flood forecasting and warning are necessary to prevent or mitigate loss and damage. Merging near real time satellite-based precipitation estimation with relatively high spatial and temporal resolutions to ground gauged precipitation data could contribute to reducing uncertainty and increasing efficiency for flood forecasting application. This study tested the applicability of satellite-based rainfall for water resources management and flood forecasting. The objectives of the study are to assess uncertainty associated with satellite-based rainfall estimation, to perform bias correction for satellite-based rainfall products, and to evaluate the performance of the bias-corrected rainfall data for the prediction of flood events. This study was conducted using a case study of Thai catchments including the Chao Phraya, northeastern (Chi and Mun catchments), and the eastern catchments for the period of 2006-2015. Data used in the study included daily rainfall from ground gauges, telegauges, and near real time satellite-based rainfall products from TRMM, GSMaP and PERSIANN CCS. Uncertainty in satellite-based precipitation estimation was assessed using a set of indicators describing the capability to detect rainfall event and efficiency to capture rainfall pattern and amount. The results suggested that TRMM, GSMaP and PERSIANN CCS are potentially able to improve flood forecast especially after the process of bias correction. Recommendations for further study include extending the scope of the study from regional to national level, testing the model at finer spatial and temporal resolutions and assessing other bias correction methods.