

Chane Arunsit 2007: Satellite Based Rainfall Estimation Over U-Taphao River Basin during Northeast Monsoon. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Mr. Dusadee Sukawat, Ph.D. 127 pages.

The purpose of this research was to study the satellite based rainfall estimation over U-taphao river basin during northeast monsoon comparing to ground based rainfall during June 2000 to January 2001 and June 2001 to January 2002. Daily rainfall data was collected from precipitation-gage network of Thai Meteorological Department and Royal Irrigation Department. Hourly GMS-5 (The Japanese Geostationary Meteorological Satellite 5) image data was downloaded from website:<http://weather.is.kochi-u.ac.jp/sat/GAME/> which included CAL, IR1, IR2, IR3 and VIS data. Statistical inference in simple linear regression and correlation analyses were used. Assumptions and procedures of the Techniques were applied from TAMSAT (Tropical Application of Meteorological SATellite) Rainfall Estimation Technique appropriately.

The optimum threshold temperature, that rainfall should be occurred, was 224 Kelvin or -49 Celsius degree. The result of estimated rainfall using the simple linear regression analyses indicated that the linear relation between CCD and estimated rainfall was reasonably good over IR1 ,IR2 and IR3 data channel for conditions: $\text{Rain} \geq 35 \text{ mm.}$, $\text{Rain} \geq 40 \text{ mm.}$, $\text{Rain} \geq 50 \text{ mm.}$, $\text{Rain} \geq 60 \text{ mm.}$, $\text{Rain} \geq 70 \text{ mm.}$ The coefficient of determination (R^2) of the equations comprised 0.620, 0.641, 0.530, 0.609, 0.680, 0.494, 0.509, 0.545, 0.498, 0.555, 0.581, 0.518, 0.494, 0.564 and 0.559 respectively.

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