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Comparison of Spatial rainfall amount from Meteorology Radar and Ground Station over Chiang Mai province

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This study aims to express a comparison of spatial analysis of rainfall between meteorology radar of Northern Royal Rainmaking Operations Center, Department of Rainmaking and Agricultural Aviation and meteorology radar from Northern Meteorological Center, Meteorological Department and Ground station by Northern Meteorological Center of Chiang Mai. Geographic Information System (GIS) has used to reveal the daily rainfall distribution, and compare with the daily rainfall of Omkoi radar, Chiang Mai province and Lamphun radar, Lamphun province. Spatial analysis was considered from Hot Spot to find relationship of rainfall between ground and radar stations. The data set of March 4th, June 10th and August 10th, 2013 were analyzed by using the Kriging method which consisted of 4 sub-methods; Spherical, Circular, Exponential and Gaussian. The data set were obtained from daily rainfall of 83 meteorological stations in the 6 provinces included Chiang Mai, Lamphun, Lamphang, Chiang Rai, Mae Hong Son and Tak. And the meteorology data from Omkoi and Lamphun radar stations were evaluated by the Mean Absolute Error (MAE) and Root Mean Square Error (RMSE).

The result shows that the spatial distribution of rainfall from ground station on March 4thcould be analyzed by the Gaussian method as the result was 9.44 mm/day (MAE), and 8.20 mm/day (RMSE), while in June 10th; as the result from MAE was 21.36 mm/day and RMSE was 20.31 mm/day. Where as in August 10th, the result from Exponential method was 22.07 mm/day (MAE) and 22.10 mm/day (RMSE). And the rainfall distribution of Omkoi radar station on March 4th, by Gaussian analysis was 3.37 mm/day (MAE) and 6.74 mm/day (RMSE), while on June 10th, the result from Circular method was 0.41 mm/day (MAE) and 0.70 mm/day (RMSE), whereas on August 10th, the result from Gaussian method was 3.20 mm/day (MAE) and 3.68 mm/day (RMSE). Finally, the rainfall distribution of Lamphun radar station March 4th, by the Circular method was 0.87 mm/day (MAE) and 0.79 mm/day (RMSE), while on 10th of June, the result from Circular method was 1.47 mm/day (MAE) and 1.24 mm/day (RMSE), and on August 10th, by the Gaussian method was 2.43 mm/day (MAE) and 1.80 mm/day (RMSE). The result from determination of rainfall distribution by hotspot method was shown an inadequate correlation between an amount of rainfall from the surface and radar stations.

Key word: Meteorology radar, Rainfall, Kriging, Spatial analysis

Author: Ms MUANG-UNE, Chanaporn

Co-author: Dr NAKAPAN, Supachai (-)

Presenter: Ms MUANG-UNE, Chanaporn

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