ASSESSMENT OF GIS SPATIAL INTERPOLATION METHODS IN ESTIMATING RAINFALL MISSING DATA

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in partial fulfilment for the award of the degree of the Bachelor of Surveying Science and Geomatics (Honours)

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I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. The project/dissertation is original and it is the result of my own work, unless otherwise indicated or acknowledged as referenced work.

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ABSTRACT

Rainfall is an important data to identify the complete rainfall record at the gauging station. There is an incompleted rainfall data due to various factors such absence of the observer and the instrument failures. Thus, to fill the gaps of missing observation in data, several techniques were used to predict the missing rainfall data. The aim of this study is to assess GIS spatial interpolation methods in estimating rainfall missing data using Inverse Distance Weighted (IDW), Thiessen Polygon and Kriging in Northern region of Malaysia. Next, the objectives of this study are to generate rainfall spatial interpolation data based on IDW, Thiessen Polygon and Kriging as well as to assess the accuracy of estimated rainfall values for each spatial interpolation methods. The research study area focuses only in the Northern Region of Peninsular Malaysia which is Pulau Pinang, Kedah, Perak and Perlis. In this study, 15 out of 143 rainfall stations with completed rainfall data were estimated with monthly basis. The most suitable method in accuracy for each methods were compared based on Root Mean Square Error (RMSE). Overall the best RMSE is found in IDW on January is (16.691) following by the worst RMSE in Thiessen Polygon on November is (2233.526). However, the RMSE for Kriging is the most consistent by annually. The finding of this study shows that Kriging is the most accurate GIS spatial interpolation method in estimating rainfall missing data. Thus, Kriging Interpolation is possible to be used to improve the conventional methods of estimating rainfall missing data.
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