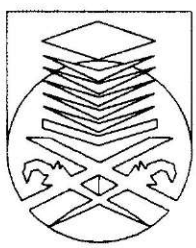
ASSESSMENT OF GIS SPATIAL INTERPOLATION METHODS IN ESTIMATING RAINFALL MISSING DATA

NORAZIMAH HANI BINTI ISMAIL

2013202606



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in partial fulfilment for the award of the degree of the

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DECLARATION

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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Name of Student	:	Norazimah Hani Ismail
Student's ID No	:	2013202606
Project/Dissertation Title	:	Assessment of GIS Spatial Interpolation Methods in Estimating Rainfall Missing Data.
Signature and Date	:	

Approved by:

I certify that I have examined the student's work and found that they are in accordance with the rules and regulations of the Department and University and fulfills the requirements for the award of the degree of Bachelor of Surveying Science and Geomatics (Honour's).

Name of Supervisor	:	Sr. Puan Rohayu Haron Narashid
Signature and Date	:	24/8/2017

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.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DECLARATION	**ii**
	ABSTRACT	**III**
	ACKNOWLEDGEMENTS	**iv**
	TABLE OF CONTENTS	**v**
	LIST OF FIGURES	**x**
	LIST OF TABLES	**xi**
	LIST OF ABBREVIATIONS	**xii**
1	**INTRODUCTION**	
	1.1 Research Background	1
	1.2 Problem Statement	2
	1.3 Aim	3
	1.4 Research Objective	3
	1.5 Study Area	4
	1.6 General Methodology	5
	1.7 Scope of Limitation	6
	1.8 Significance Study	7
	1.9 Outline of the Chapter	7
	1.10 Summary	8

3.6 Data Processing 24

3.6.1 Database Entry 25

3.6.2 Data Processing of Rainfall Data 25

3.6.3 Spatial Interpolation on IDW 25

3.6.4 Spatial Interpolation on Kriging 26

3.6.5 Spatial Interpolation on Thiessen Polygon 26

3.6.6 The Estimate Values of Rainfall Missing Data 26

3.7 The Result in Estimating Rainfall Missing Data for Analysis 27

3.8 Produce Map 27

3.9 Summary 27

4 **RESULTS AND ANALYSIS**

4.1 Introduction 28

4.2 Implementation of Study 28

4.3 Maps of Rainfall Based on Different Spatial Interpolation Method. 29

4.3.1 Rainfall Map on January 2011 using IDW 30

4.3.2 Rainfall Map on January 2011 using Kriging 31

4.3.3 Rainfall Map on January 2011 using Thiessen Polygon 32

4.4 Estimate Rainfall Values from Different Spatial Interpolation Methods 33