



UNIVERSITI TEKNOLOGI MARA

**THE EFFECT OF FLOOD DEPTH ON LAND USE
2013 AND 2020 IN FLOOD INUNDATION
MAPPING AT KUALA NERANG, KEDAH**

SITI NOOR AMIRA BINTI ISMAIL

Thesis submitted in fulfilment of
requirements for the degree of
Bachelor of Surveying Science and Geomatics (Hons)

Faculty of Architecture, Planning and Surveying

February 2021

AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Siti Noor Amira binti Ismail
Student I.D. No.	:	2016332067
Programme	:	Bachelor of Surveying Science and Geomatics (Honours) – AP220
Faculty	:	Architecture, Planning & Surveying
Thesis/Dissertation Title	:	
Signature of Student	:
Date	:	

ABSTRACT

The most destructive natural catastrophe in Malaysia has been flooded. In 2010, heavy rainfall in North Peninsular Malaysia caused flooding in early November. In the states of Perlis and Kedah, are the worst hit areas. The selected study area is Sungai Padang Terap, Kedah because during the 2010 flood the area was most affected. Disaster prevention is increasingly necessary due to the rising environmental threats created by climate change. Then, this study aims to analyze the effect of DEMs on Flood Inundation Mapping and there were two objectives of this study, i) to generate flood depth map and ii) to compare the effect of manning value to the flood depth using different DEM. This study applied a method by generate flood inundation map using IFSAR DEM for 2010, and for land use classification are using image satellite data for the year 2013 and 2020 and generate the land use map by using ArcMap software meanwhile flood map is generated by using HEC-RAS. The Steady flow analysis was used to generate flood model with the Manning n value. The result is expected to predict the effect of flood depth on land use in Flood Inundation Mapping and will beneficially by providing more understanding information related to the flood.

TABLE OF CONTENTS

CONFIRMATION BY PANEL OF EXAMINERS	i
AUTHOR'S DECLARATION	ii
SUPERVISOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	xi
CHAPTER 1	1
INTRODUCTION	1
1.1 Introduction	1
1.2 Research Background	1
1.3 Problem Statement	3
1.4 Research Question	4
1.5 Aim and Objectives	5
1.6 Scope of Study	5
1.7 Significant of Research	5
1.8 Summary	6
CHAPTER 2	7
LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Definition of Flood	7
2.3 Flood Inundation	8
2.4 A Study of Land Use Change	9
2.5 Flood Model	11
2.6 Hydraulic Modelling	12
2.7 Water Discharge	13
2.8 HEC-GeoRAS	13
2.9 HEC-RAS Hydraulic Model	14

2.10	Comparison between Predicted and Observed Water Depth	15
2.11	Summary	15
	CHAPTER 3	16
	METHODOLOGY	16
3.1	Introduction	16
3.2	Methodology	16
3.3	Literature Review	19
3.4	Data Acquisition	22
3.5	Data Processing	26
3.5.4	Stream Centerline Attributes	31
3.5.5	Cross-Sectional Cut Lines Attribute	31
3.5.8	Steady Flow Analysis	35
3.6	Summary	39
	CHAPTER 4	40
	RESULT AND ANALYSIS	40
4.1	Introduction	40
4.2	To Generate Flood Depth Map Using SRTM and IFSAR DTM	40
4.3	To Compare the Effect of Flood Depth to The Land Use in 2013 and 2020	49
4.4	Summary	54
	CHAPTER 5	55
	CONCLUSION AND RECOMMENDATION	55
5.1	Introduction	55
5.2	Conclusion	55
5.3	Recommendation	56
	REFERENCES	57