

UNIVERSITI TEKNOLOGI MARA

**FOREST FIRE TREND ANALYSIS AND WITH
FACTORS EFFECTING IT**

NOR FATHIAH BINTI MOHD ISA

Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Surveying Science and Geomatics

Faculty of Architecture, Planning and Surveying

January 2020

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 : Nor Fathiah Binti Mohd Isa

Student I.D. No. : 2015658064

Programme : Bachelor of Surveying Science and
Geomatics (Honours) – AP220

Faculty : Architecture, Planning & Surveying

Thesis/Dissertation Title : Forest Fire Trend Analysis And With Factors
Effecting It

Signature of Student :

Date : January 2020

ABSTRACT

In Malaysia, forest fires have been a major cause of change in forest structure and also to change the natural functioning of ecosystems in the 20th century. In Kedah, it has recorded the highest number of fires caused by the El Nino phenomenon so far this year (Datuk Wira Wan Mohd Nor Ibrahim, 2016) and for that we only selected the area from Langkawi and Alor Setar in Kedah as it is the most affected area of forest fires supported by meteorological data. With this project, the goal is to analyze forest fire trends using hot spot analysis and their relationship with factors affecting them in Kedah using Geospatial information systems (GIS) and we use software such as ArcGis and QGis Software to analyze data from meteorologists and from the Department Fire Rescue. The objectives of this study were to identify the forest fire hot spots in the study area and to analyze the parameters selected for the forest fire areas that were the main focus of the study to determine the forest fire risk zone. In this study, the base map image was from (JUPEM) Department. From the base map hot spots, the results will come as a reference to analyze the area. Research data has been collected from 2014 to 2019. It looks at the differences each year when fires occur as well as finding and analyzing the selected factors based on data availability that cause fires. The results of this study were to establish hotspots for fire risk areas as a monitoring system to help the fire and rescue department (Fire) easily manage this area and to help them understand the reasons for the fire as a reference for them to prevent and help them to reduce the risk of fire in the area.

TABLE OF CONTENT

Contents

CONFIRMATION BY PANEL OF EXAMINERS	
AUTHOR'S DECLARATION	ii
SUPERVISOR'S DECLARATION	iii
ABSTRAK	iv
ABSTRACT	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENT	vii
LIST OF TABLES	v
LIST OF FIGURE	vi
CHAPTER 1	1
INTRODUCTION	1
1.1 Background of study	1
1.2 Problem Statement	2
1.3 Research Question	3
1.4 Aim and Objective	3
Aim of Study	3
Objective of study	3
1.5 Scope of Study	4
1.6 Significant of Research	4
CHAPTER 2	5
LITERATURE REVIEW	5
2.1 Introduction	5
2.2 Forest Fire Definition	5
2.3 Fire Hazard Definition	6
2.4 Hotspot Analysis Definition	6
2.5 Kernel Density	6
2.6 Inverse distance weighted (IDW)	7
2.7 Kriging	7
2.8 Data Collection	8
CHAPTER 3	9
METHODOLOGY	9
3.1 Introduction	9

3.2	Study Area	13
3.3	Detailed Data	14
3.3.1	Base Map Kedah	14
3.3.2	Base Map Study area	15
3.4	Data acquisition and Data processing	16
3.5	Result and analysis	16
3.6	Conclusion	16
CHAPTER 4		17
RESULT AND ANALYSIS		17
4.1	Introduction	17
4.2	Identification area of forest fire hotspot using Geo-references	17
4.2.1	Hotspot Map 2014	20
4.2.2	Hotspot Map 2015	23
4.2.3	Hotspot Map 2016	26
4.2.4	Hotspot Map 2017	29
4.2.5	Hotspot Map 2018	32
4.2.6	Hotspot Map 2019	35
4.2.7	Hotspot Map 2014- 2019	41
4.2.5	Conclusion	42
4.3	Selection of parameter that for forest fire area based on forest fire hotspot.	43
4.3.1	Temperature Parameter	43
4.3.1.2	Map Mean Temperature 2014 and 2015	44
4.3.1.4	Map Mean Temperature 2014 and 2015	46
4.3.1.5	Map Mean Temperature 2018 and 2019	48
4.3.1.7	Map Mean Temperature 2014- 2019	50
4.3.2	Rainfall Parameter	52
4.3.2.2	Map Mean Rainfall 2014 and 2015	53
4.3.2.4	Map Mean Rainfall 2016 and 2017	55
4.3.2.3	Map Mean Rainfall 2018 and 2019	57
4.3.2.6	Map Mean Rainfall 2014- 2019	59
4.3.3	Mean Wind Speed Parameter	61
4.3.3.2	Map Mean Wind speed 2014 and 2015	62
4.3.3.4	Map Mean Wind speed 2016 and 2017	64
4.3.3.6	Map Mean Wind speed 2018 and 2019	66
4.3.3.8	Map Mean Wind Speed 2014-2019	68