

UNIVERSITI TEKNOLOGI MARA

**DROUGHT TRENDS ANALYSIS FOR THE PAST
10 YEARS IN PERLIS USING GIS AND REMOTE
SENSING APPLICATION**

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Thesis submitted in fulfillment
of the requirements for the degree of
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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.

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ABSTRACT

Drought phenomenon has often occurred in Malaysia especially in Perlis. Perlis has been facing a rising temperature early every year that can affect the land use and vegetation. Based on data collected from 13 rainfall stations in Perlis, a data processing was carried out in order to find the trend pattern of rainfall from 2007-2016 and to analyse the impact of drought on vegetation change by calculating the value of Standardized Precipitation Index (SPI) and Normalized Differences Vegetation Index (NDVI). In this study, the Geographic Information System (GIS) and remote sensing played a key role in studying the different types of processing in field of meteorological drought and its impact in vegetation health. SPI value was interpolated to get the spatial pattern of meteorological drought. Through interpolation method, Inverse Distance Weighted (IDW) method was used to verify the trends value for meteorological drought occurrences in Perlis. In order to show the trend pattern of meteorological drought based on SPI value, 30 years of rainfall data was collected and processed using DrinC software. ERDAS Imagine software was also used to process the satellite image of Landsat 5 TM, Landsat 7 ETM and Landsat 8 OLI-TIRS which was obtained from the U.S. Geological Survey (USGS) to get the NDVI value in Perlis. NDVI value detected the intensity and vegetation health area that has been damaged by meteorological drought based on the SPI value. The final results show the map of Perlis with the trend pattern of drought for the past 10 years and the impact of drought on the vegetation health.

Keywords: Standardized Precipitation Index (SPI), Normalized Differences Vegetation Index (NDVI), Geographic Information System (GIS), Remote Sensing, Inverse Distance Weighted (IDW), Geographic Information System (GIS)

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