

SPATIAL VARIATION OF WILDFIRE EFFECTS ON FOREST COVER
USING GEOSPATIAL TECHNIQUES

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**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

JULY 2024

DECLARATION

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

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ABSTRACT

A forest fire is an uncontrolled, fast-spreading fire that damages grasslands, plants, and woody areas. The wildfire can occur due to the temperature and dry conditions such as open burning activities. Nowadays, remote sensing technology has been widely used to monitor the effect of forest fires based on forest cover density estimation. Thus, this study aims to determine the wildfire effects on forest cover in Bachok, Kelantan (2019-2020) using remote sensing techniques of Land Surface Temperature (LST) and Tasseled Cap Transformation (TCT) techniques from Landsat 8 TIRS satellite images and spatial variation regression model. The methods involved retrieval of Landsat 8 TIRS LST, estimating burn severity based on the difference of vegetation, wetland, and surface brightness from the TCT technique, and determining the spatial variation in the relationships between LST and forest cover from TCT using Multiscale Geographical Weighted Regression (MGWR). Findings based on Ordinary Least Square (OLS) with r -squared = 0.68 and 0.72 have shown the relationships between LST and forest cover represented by vegetation, wetland, and surface brightness. The results of MGWR slightly improve the relationships with r -squared = 0.78 and 0.82). This study will show the effect area of pre and post-forest fire on vegetation and wetlands through the value of TCT and LST. The findings of this study are significant to help the public, the Department of Environment, The Forestry Department Peninsular Malaysia, and FRIM in pre and post-forest fires.

Keyword: Forest fire, Land Surface Temperature, Tasseled Cap Transformation, Relationship, Multiscale Geographical Weighted Regression (MGWR).

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