

MANGROVE NORMALIZED DIFFERENCE VEGETATION INDEX
(NDVI) METHOD FOR MAPPING HEALTHINESS OF MANGROVE
FORESTS IN KILIM, LANGKAWI

NOR HAJARATUN FATIN BINTI MOHAMAD NOR

2019219818



COLLEGE OF BUILT ENVIRONMENT
UNIVERSITI TEKNOLOGI MARA
PERLIS

AUGUST 2023

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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)**

AUGUST 2023

CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 18 July 2023 to conduct the final examination of Nor Hajaratun Fatin Binti Mohamad Nor on his Bachelor of Surveying Science and Geomatics (Hons) thesis entitled “Mangrove Normalized Difference Vegetation Index (NDVI) Method for Mapping Healthiness of Mangrove Forests in Kilim, Langkawi” in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiner recommends that the student be awarded the relevant degree. The Panel of Examiners was as follows:

Sr Mohd Khairy bin Kamarudin
Lecturer
College of Built Environment, CBE
Universiti Teknologi MARA
(Supervisor)

Sr. Gs. Dr. Fazly Amry bin Mohd
Lecturer
College of Built Environment, CBE
Universiti Teknologi MARA
(Co- Supervisor)

Sr Ashnita binti Rahim
Lecturer
College of Built Environment, CBE
Universiti Teknologi MARA
(Panel 1)

Gs. Dr Nurul Ain binti Mohd Zaki
Lecturer
College of Built Environment, CBE
Universiti Teknologi MARA
(Panel 2)

SR DR ROHAYU HARON NARASHID
Head of Department
College of Built Environment, CBE

Date: 18 July 2023

AUTHOR'S 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.

In the event that my project/dissertation be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree of the Bachelor of Surveying Science and Geomatics (Honours) and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Student : Nor Hajaratun Fatin Binti Mohamad Nor
Student's ID No : 2019219818
Project/Dissertation Title : Mangrove Normalized Difference Vegetation Index (NDVI) Method for Mapping Healthiness of Mangrove Forests in Kilim, Langkawi.
Signature and Date : 1st August 2023

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 School and University and fulfils the requirements for the award of the degree of Bachelor of Surveying Science and Geomatics (Honours).

Name of Supervisor : Sr Mohd Khairy Bin Kamarudin
Signature and Date :

ABSTRACT

Mangrove forests are present in the intertidal zone, located within small groups of trees and shrubs in the harsh interface between sea and land. Nevertheless, the health of mangrove trees has been impacted by changes in the seasons and the level of disturbance in the mangrove habitat. Mangrove erosion is caused by a variety of indirect effects of climate change. For this purpose, two Sentinel 2A images from 2019 to 2023 were used in this research to identify mangrove areas and extract NDVI values. More interestingly, Object Based Image Analysis (OBIA) is used in this research to classify the mangrove area. There are 10 categories for classifying images. The findings indicate that mangrove area is 707.751 hectares in 2019 and 599,464 hectares in 2023. Research results show that the mangrove area has decreased up to 108.287 hectares, or 8%. The Natural Breaks (Jenks) method was initially utilised to compute the NDVI values to categorise the NDVI map. The value of the healthiness of mangrove trees is then evaluated using a Difference NDVI map between 2019 and 2023 to determine whether it is positive or negative. The results show the range of NDVI values in 2019 is between -0.5 and 0.9, while the range in 2023 is between -0.07 and 0.60. The research provides information on the state of the mangrove ecosystems that can be used to inform future conservation and management initiatives.

Keywords: Mangrove, Kilim, Object-Based Image Analysis (OBIA), Healthiness, Normalized Difference Vegetation Index (NDVI).