

UNIVERSITI TEKNOLOGI MARA

**DETECTION OF THE RIVER
SEDIMENT DEPOSITION AREA AT
KUALA PERLIS RIVER MOUTH
USING LANDSAT 8 OLI WITHIN
THE YEARS 2019, 2020 AND 2021**

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Thesis submitted in fulfillment of
the requirements for the degree of
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(Hons)**


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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

Sedimentation at the mouth of the river always occurs in Kuala Perlis disrupting the ferries and boats' travel, especially during the low tide. Therefore, this study aimed to compare the best method for foreseeing river sediment deposition between K-Means unsupervised image classification machine learning and water spectral indices (MNDWI) to analyze the areas most influenced by deposited river sediments from the clustered images. Quantification of Landsat 8 OLI satellite images was applied using ENVI software on the study area for detecting sedimentation in the study area that used image data band correlation in deposited river sediment through unsupervised classifier algorithm and selection of spectral bands for MNDWI. The determination of determinant bands from analysis of correlation coefficient resulted in NIR bands for their lowest R^2 coefficient that ranged R^2 0.5 to R^2 0.7. The selected K-Means classification method has been taken for further clustered image analysis compared to the MNDWI method. From the analysis through stage's statistic, visual observation and previous studies review, the river sediment deposition at the river mouth was significantly increased from the year 2019 to the year 2021. These results were supported with the percentage of increase (14%) for riverbed regions subjected to sediment deposition. The location of Kuala Perlis itself exacerbated the problem of dumping sediment returned to the river mouth in a brief period, which is also reliant on the wave flow. This study was beneficial for the future development of Kuala Perlis and local communities nearby.

Keywords: River sediment deposition, Remote sensing, Unsupervised machine learning

TABLE OF CONTENT

Content	Page
CONFIRMATION BY PANEL OF EXAMINERS	i
SUPERVISOR'S DECLARATION	iv
ABSTRACT	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENT	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS / NOMENCLATURE	xi
CHAPTER 1: INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	3
1.3 Research Question	4
1.4 Aim and Objectives	4
1.5 Study Area	5
1.6 Scope and Limitation of Study	6
1.7 Significance of Research	6
1.8 Summary	7
CHAPTER 2: LITERATURE REVIEW	8
2.1 Introduction	8
2.2 River Sedimentation	8
2.3 Landsat 8 OLI Satellite Imagery	9

2.4 Correlation Coefficient between Determinant Image Bands	9
2.5 Unsupervised Machine Learning	10
2.5.1 K-Means Classifier	11
2.6 Modified Normalized Difference Water Index (MNDWI)	11
2.7 Previous Studies in Sedimentation Detection using Remote Sensing	12
2.7 Summary	13
CHAPTER 3: METHODOLOGY	14
3.1 Introduction	14
3.2 Conceptual Diagram	14
3.3 Software Used	16
3.4 Landsat 8 OLI Data Description	16
3.5 Initial Image Processing	18
3.5.1 LayerStacking	18
3.5.2 Radiometric Correction	18
3.5.3 ImageSubset	19
3.5.4 Geometric Correction	19
3.5.5 Correlation Analysis	19
3.6 Image Processing	19
3.6.1 K-Means Unsupervised Machine Learning	19
3.6.2 MNDWI	20
3.6.3 Accuracy Assessment	20
3.7 Image Analysis	21
CHAPTER 4: RESULT AND ANALYSIS	23
4.1 Introduction	23
4.2 Determination of Method in Foreseeing River Sediment Deposition	23
4.3 Identification of the River's Regions Most Influenced by Deposited River Sediment from Clustered Image	28
CHAPTER 5: CONCLUSION	38