

THE SHORT TERM CHANGE OF MANGROVE AREA  
AND SAND SPIT IN KELANTAN DELTA USING  
REMOTE SENSING AND GIS

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**THE SHORT TERM CHANGE OF MANGROVE AREA AND SAND SPIT IN  
KELANTAN DELTA USING REMOTE SENSING AND GIS**

**By**

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the requirements for the degree of  
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**The Short Term Change of Mangrove Area and Sand Spit in Kelantan Delta Using Remote Sensing and GIS by Norhafiza Hadib, Matric No. UK 5339** has been read and all the alteration and correction recommended by examiners have been done. This final draft submitted to Department of Marine Science has been accepted as fulfillment of the requirement for Bachelor of Science (Marine Biology) under the Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia.

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## LIST OF ABBREVIATION

EMR	- Electromagnetic Radiation
ESRI	- Environmental Systems Research Institute
GCP	- Ground Control Point
GIS	- Geographical Information System
HRV	- High Resolution Visible
ISODATA	- Iterative Self-Organizing Data Analysis Technique
MACRES	- Malaysian Center for Remote Sensing
MRSO	- Malaysian Rectified Skewed Orthomorphic
SPOT	- Systeme Probatoire de l'Observation de la Terre
m/yr	- meter per year

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## ABSTRACT

Remote sensing and GIS are commonly used tools in coastal zone management, forestry and land use planning. This research contributes to the monitoring of short term shoreline changes in Kelantan Delta using remote sensing and GIS. The area can be interpreted from three multi-date SPOT satellite images. The shoreline movement can be determined especially at the sand spit formation within Kelantan Delta. Processes of erosion, deposition and transportation of sediment occurring throughout the years contribute to the unstable formation of sand spits and islands within the Kelantan Delta. Between 1989 and 2000 the sand spits in Kelantan Delta moved at a distance about 13.00 meters per year and islands within Kelantan Delta experienced low mutable changes which were less than 1.00 meter per year. Mangrove forest depleted around 140.00 hectares between 1988 and 2000 and already reduced the species distribution.

## ABSTRAK

Penderiaan jauh dan GIS adalah kaedah yang biasa digunakan dalam bidang pengurusan zon pantai, perhutanan dan perancangan guna tanah. Kajian ini menyumbang ke arah pengawasan jangka pendek bagi perubahan garis pantai di Delta Kelantan menggunakan kaedah penderiaan jauh dan GIS. Kawasan kajian boleh diinterpretasi dari tiga imej satelit SPOT yang pelbagai tarikh. Pergerakan garis pantai dapat ditentukan terutama pada pembentukan tanjung di sekitar kawasan Delta Kelantan. Proses hakisan, penambahan dan peralihan endapan di sekitar Delta Kelantan berlaku sepanjang tahun dan ini menyumbang ke arah pembentukan tanjung dan pulau yang tidak stabil. Dari tahun 1989 hingga 2000 secara purata, tanjung-tanjung yang terbentuk di kawasan Delta Kelantan mengalami perubahan jarak sehingga 13.00 meter setahun dan pulau-pulau di sekitarnya mengalami perubahan yang agak rendah dimana kurang dari 1.00 meter setahun. Keluasan hutan paya bakau berkurang sehingga 140.00 hektar di antara tahun 1988 hingga 2000 dan seterusnya mengurangkan taburan spesis.