

UTILIZATION OF REMOTE SENSING DATA FOR
SEAGRASS MAPPING

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FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2004

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UTILIZATION OF REMOTE SENSING DATA FOR SEAGRASS MAPPING

By

Chan Mei Ling

Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science
(Marine Biology)

Department of Marine Sciences
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KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
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JABATAN SAINS SAMUDERA
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PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan projek penyelidikan bertajuk:
'Utilization of Remote Sensing Data for Seagrass Mapping' oleh **Chan Mei Ling**, No. Matrik **UK 6050** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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ABSTRACT

The main objective of this study is to determine the seasonal variation of seagrass and the distribution of seagrass by utilizing remote sensing data. Four satellite images (Landsat TM) from different years and different month taken in North East, South West, transition period and End of South West monsoon season are obtained. Pre-processing such as atmospheric correction, water column correction and geometric correction are done before images being analyzed. Using image-processing technique, Landsat TM data was processed to map seagrass areas around Perhentian Island. Ground truth data is collected to match the images before thematic map being produced. The extraction technique employed is based on band rationing, using the combination of band 2 / band1 and band 3 / band 1. However, only band ratio-band3 / band1 is able to map the seagrass distribution. Supervised and unsupervised classification that being carried out are able to produce coarse mapping only due to insufficient ground truth information. Statistic analysis is carried out to test accuracy of maps being produced. The result shows the changes of seagrass area in different monsoon season; indicating turbidity is another important factor controlling the growth of seagrass.

ABSTRAK

Objektif utama kajian ini adalah untuk menentukan perbezaan rumput laut and taburannya pada musim berlainan deanga menggunakan data remote sensing. Empat image satellite (Landsat TM) yang mewakili musim Timur Laut, musim Barat Daya, musim peralihan dan musim akhir Barat Daya dari tahun dan bulan yang berlainan diperolehi. Pre-processing seperti “atmospheric correction”, “water column correction” and “geometric correction” dilakukan sebelum image Landsat dianalisis. Dengan menggunakan teknik image-processing, peta taburan rumput laut di sekitar Pulau Perhentian dapat dihasilkan. Data ground truth dikumpul untuk memadankan image Landsat sebelum peta thematic dihasilkan. Teknik analisis yang dipraktikkan adalah berasaskan band rationing dengan menggunakan gabungan band 2 / band1 dan band 3 / band 1. Analisis statistik dilakukan untuk menguji accuracy peta yang dihasilkan. Akan tetapi, hanya gabungan band3 /band1 yang memberi keputusan nyata. “supervised classification” dan “unsupervised classification” yang dilakukan hanya dapat menghasilkan peta taburan secara kasar disebabkan kekurangan data ground truth. Keputusan kajian ini menunjukkan perubahan pada rumput laut pada musim monsoon yang berlainan dan kekeruhan air merupakan salah satu faktor penting yang mempengaruhi tumbesaran rumput laut.