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UNIVERSITY OF TARTU

2007

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**MANGROVES VEGETATION MAPPING AND DISTRIBUTION USING HIGH
SPECTRAL RESOLUTION IMAGE OF QUICKBIRD AT TEN SELECTED ISLANDS
IN KELANTAN DELTA**

BY

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

**Department of Marine Science
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UNIVERSITI MALAYSIA TERENGGANU
2007**

1100054043

This project should be cited as:

Erda-Hazwani, A. M. 2007. Mangroves Vegetation Mapping and Distribution Using High Spectral Resolution Image of Quickbird at Ten Selected Islands in Kelantan Delta. Final Year Project Report, Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu. 68p.

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**PENGAKUAN DAN PENGESAHAN
LAPORAN PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **“Mangroves Vegetation Mapping and Distribution using High Spectral Resolution Image of Quickbird at Ten Selected Islands in Kelantan Delta”** oleh **Erda Hazwani Binti Abdul Malek** No. Matrik **UK10405** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah **Sarjana Muda Sains Biologi Marin** Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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ACKNOWLEDGEMENT

ALHAMDULLILAH, first of all I would like to thank Allah s.w.t who gives me courage and strength to finish this project. I also would like to give my appreciation to my project supervisor, Assoc. Prof. Sulong Bin Ibrahim and my co-supervisor Mr. Mohd Suffian Bin Idris for their guidance and advises in order to complete in thesis. Thank you also to the Kota Bharu Forestry Department officers that help me a lot during my sampling at the Kelantan Delta.

To Miss Wan Nurzalia Bt Wan Saelan, Mr. Yunus Bin Ibrahim, Mr. Ruzalizam Bin Katimon and all the research assistants, thank you very much for their help and assisted during the study. This appreciation also dedicated to En. Abdull Habir bin Alias, En. Ghazali bin Salam, all the lab assistants and boatmen, they had helped me a lot.

Not forgotten to all my housemate Amal, Ida and Has and my neighbors Huda, Leya and Zati who had helping me and lending me their stuff that can help me to finish this project. Finally, to everybody who involves directly or indirectly in this project.

Thank you very much.

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LIST OF SYMBOLS

Symbol

m	Meter
Km	Kilometer
cm	Centimeter
µm	Micrometer
ha	Hectares
vs	Versus
NCES	The National Coastal Erosion Study
VHR	Very High Resolution
NIR	Near Infrared
GIS	Geographical Information System
TM	Thematic Mapper
GPS	Global Positioning System
DBH	Diameter at the Breast Height
INOS	Institute of Oceanography
GCP	Ground Center Point
RMSE	Root–Mean–Square errors
P. Che Minah	Pulau Che Minah
P. Bedal	Pulau Bedal
P. Layang-Layang	Pulau Layang- Layang
P. Rulah	Pulau Rulah
Tg. Duff	Tanjung Duff

ABSTRAK

Hutan paya laut merupakan salah satu ekosistem pantai yang paling produktif dan berkembang dengan pesat di kawasan terlindung di estuari dan delta. Hutan Paya Laut membentuk kawasan terlindung dan membantu mengawal hakisan. Adalah sangat penting untuk melindungi dan memantau keadaannya supaya sentiasa dalam keadaan yang tidak terancam. Delta Kelantan merupakan sebuah hutan paya laut yang baru terbentuk. Sebuah kajian dilakukan untuk memperolehi maklumat tentang status dan taburan hutan paya laut di Delta Kelantan. Kajian ini mengelaskan hutan paya laut di sepuluh pulau terpilih di Delta Kelantan menggunakan imej satelit dari sensor QuickBird. Imej QuickBird digunakan kerana ia merupakan ciptaan terbaru sensor satellite dengan nama 'Very High Resolution (VHR)' dengan resolusi 0.61m. Kajian telah dijalankan pada September dan Oktober 2006. Pemetaan tumbuhan hutan paya bakau telah dilakukan menggunakan pengelasan 'unsupervised' dan 'supervised'. Bagi memastikan data 'ground truthing' dan kaedah inventori ringkas telah dilakukan di empat buah iaitu Pulau Che Minah, Pulau Tengkorak, Pulau Bedal dan Pulau Terendak. Sebelas kelas hutan tumbuhan telah dikenalpasti iaitu *Avicennia*, *Nypa fruticans*, 'mix mangroves', *Sonneratia-Avicennia*, *Avicennia-Nypa*, *Acanthus-Nypa*, *Sonneratia-Nypa*, *Sonneratia-Acanthus*, *Hibiscus-Nypa*, *Acanthus-Acrosticum* dan *Rhizophora* spp. di kawasan penanaman semula. Tumbuhan paya laut tumbuh secara menyeluruh di seluruh pulau di Delta Kelantan. Imej Quickbird dapat mengenalpasti kelas tumbuhan dengan baik tetapi tidak sehingga peringkat spesies mamandangkan ia hanya mempunyai empat 'bands'.

ABSTRACT

Mangroves are among the most productive coastal ecosystem and they are developing well in sheltered estuaries and deltas. It is very importance to protect and monitor to make sure that they will always in good conditions. Kelantan Delta is new mangroves. A study was done to obtain the information of the mangroves status and distribution in Kelantan Delta. This study classifies mangroves vegetation at ten selected islands of Kelantan Delta using QuickBird imagery. QuickBird imagery was used because it is the latest of Very High Resolution (VHR) satellite sensor with 0.61m resolution. The study was done at the September to October 2006. Mapping of the mangroves vegetation at the western part of Kelantan Delta was done using unsupervised and supervised classification. To clarify the ground truthing data, simple inventory procedure was done at four of the islands which were Pulau Che Minah, Pulau Tengkorak, Pulau Bedal and Pulau Terendak. Eleven types of mangrove forests: *Avicennia*, *Nypa fruticans*, mix mangroves, *Sonneratia-Avicennia*, *Avicennia-Nypa* *Acanthus-Nypa*, *Sonneratia-Nypa*, *Sonneratia-Acanthus*, *Hibiscus-Nypa*, *Acanthus-Acrosticum* and *Rhizophora* spp. replanting area were classified. Mangrove vegetations were distributed widely in all of the islands at the western part of Kelantan Delta. Quickbird image had successfully identified the vegetation classes but not until species due to it only has four bands.