BENTHIC HABITAT MAPPING IN LANG TENGAH ISLAND, TERENGGANU USING QUICKBIRD MULTISPECTRAL DATA

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FACULTY OF MARITIME STUDIES AND MARINE SCIENCES
UNIVERSITI MALAYSIA TERENGGANU
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BENTHIC HABITAT MAPPING IN LANG TENGAH ISLAND, TERENGGANU USING QUICKBIRD MULTISPECTRAL DATA

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

Department of Marine Science
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Final Research Project Report Declaration and Verification Form

DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Benthic habitat mapping in Lang Tengah Island, Terengganu with QuickBird Multispcetral data by **Quek Kai Tyng**, Matric No. **UK 15420** have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree **Bachelor of Science in Marine Science**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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ABSTRACT

Coral reefs are the most important benthic habitat in nearshore areas as they provide important ecosystem services and economic benefits. Most coral reef are threatened, degradation and loss, and hence, monitoring and management is very important. A study was done in Lang Tengah Island to monitor the impact of development. This study developing a habitat map for documenting the changing conditions associated with Lang Tengah Island coastal ecosystem with QuickBird image. QuickBird image was used because it is fine spatial resolution image which suitable for evaluating benthic habitats. Mapping of the benthic habitat was done by using unsupervised and supervised classification. Different classification techniques were evaluated to determine the best classification technique for tropical benthic habitat mapping. This study is more focus on evaluates the common used supervised classification techniques, which are maximum likelihood classification algorithm, minimum distance to mean classification algorithm and parallelepiped classification algorithm. QuickBird image had successfully identified the benthic habitat but not until species. Band 1 (blue) and band 2 (green) image with accuracy of minimum 70.00 % for Pasir Air and Pasir Pandak was suitable for benthic mapping. Band 1 image more suitable for deeper water mapping, while band 2 image more suitable for shallower water mapping. Maximum likelihood classification algorithm was the best classification techniques with highest accuracy compared to other supervised classification techniques. Further mapping project should carried out from time to time to assess the changes of benthic habitat in Lang Tengah Island.

PEMETAAN HABITAT BENTOS DI PULAU LANG TENGAH DENGAN MENGGUNAKAN QUICKBIRD PELBAGAI SPEKTRAL DATA

ABSTRAK

Batu karang merupakan habitat benthos yang amat penting di kawasan persisiran pantai, sebab ia menyumbangkan proses ekosistem dan keuntungan ekonomi yang penting. Kebanyakan batu karang mengalami ancaman, kerosakkan dan kematian, oleh itu kawalan dan pengurusan amat diperlukan. Kajian telah dijalankan di Pulau Lang Tengah dengan tujuan mengawal kesan pembangunan. Kajian ini menghasilkan peta habitat untuk dokumentasi keadaan perubahan yang berkenaan dengan ekosistem persisiran Pulau Lang Tengah dengan menggunakan gambar QuirdBird. Gambar QuirckBird dipilihkan kerana ia mempunyai spasial resolusi yang halus amat sesuai untuk menilaikan habitat bentos. Pemetaan habitat bentos akan dihasilkan dengan pengelasan tidak diselia dan pengelasan menyelia. Pelbagai teknik pengelasan akan dinilaikan untuk menentukan teknik pengelasan yang terbaik untuk pemetaan habitat bentos tropika. Kajian ini lebih menekan kepada penilaian teknik pengelasan menyelia yang selalu digunakan, iaitu pengelasan kemungkinan maksimum, pengelasan minimal jarak kepada min dan pengelasan parallelepiped. Gambar QuickBird telah berjaya digunakan untuk mengenalpasti habitat bentos tetapi tidak dapat dikenalpasti sehingga tahap species. Gambar band 1 (biru) dan band 2 (hijau) dengan minimum ketepatan 70.00 % bagi Pasir Air dan Pasir Pandak adalah sesuai digunakan dalam pemetaan benthos. Gambar band 1 lebih sesuai untuk pemetaan kawansan air dalam, manakala gambar band 2 lebih sesuai untuk pemetaan kawasan air cetek. Pengelasan kemungkinan maksimum adalah teknik

pengelasan yang paling baik dengan ketepatan yang tertinggi antara semua teknik pengelasan menyelia. Projek pemetaan yang berterusan harus dijalankan dari masa ke semasa untuk menngawal perubahan di Pulau Lang Tengah.