

**DETERMINATION OF CORAL REEF CHANGES FROM SATELLITE
IMAGERY AND GIS TECHNOLOGY AT BIDONG ISLAND COASTAL AREA**

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By

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**Research Report Submitted In Partial Fulfillment Of
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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

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

Determination of Coral Reef Changes from Satellite Imagery and GIS Technology at Bidong Island Coastal Area by Nur Hidayah Binti Ngadiman, Matric No, UK 20557 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 (Marine Science)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREATION/SYMBOLS

%	Percentage
DN	digital number
pH	potential hydrogen
L	satellite radiance
$q_{\text{pixel,band}}$	digital value
absCalFactor Band	absolute radiometric calibration factor
$\Delta\lambda_{\text{Band}}$	effective bandwidth of each band
ρ	satellite reflectance
π	3.14152
d^2	the square of the earth-sun distance in astronomical units
ESUN	mean solar irradiance
SZ	sun zenith angle in radians
ENVI	Environment for Visualizing Images
ln	natural algorithm
GPS	Global Positioning System
DGPS	differential GPS

ABSTRACT

Image analysis from satellite imagery for mapping of coral at shallow water area is important for knowing the habitat distribution and its changes. Satellite remote sensing method for universal habitat-mapping has been shown to be cheaper (Mumby *et.al.*, 1997). Even though satellite image processing is a complex task but the outcome will bring lots of use. In this study, image from QuickBird satellite for Bidong Island coastal area year 2011 were used and it was processed using ENVI 4.7 software. A whole map of coral distribution was produced and the coral cover at study area was detected where 52.46% of it is life coral, 21.31% of dead coral with algae, 9.84% of sand and 16.39% of rubble. It is found from the changes of coral cover of Bidong Island coastal area 2007 and 2011 that life coral cover had increase by 19.85%.

ABSTRAK

Menganalisis imej daripada imej satelit untuk pemetaan batu karang di kawasan air cetek adalah penting untuk mengetahui taburan habitat dan perubahannya. Kaedah penderiaan jarak jauh bagi pemetaan habitat telah terbukti lebih murah (Mumby *et.al.*, 1997). Walaupun pemprosesan imej satelit merupakan satu tugas yang kompleks tetapi hasilnya akan membawa banyak faedah. Dalam kajian ini, imej dari satelit QuickBird untuk kawasan perairan Pulau Bidong tahun 2011 telah digunakan dan ia telah diproses dengan menggunakan perisian ENVI 4.7. Sebuah peta taburan batu karang dapat dihasilkan dan taburan batu karang di kawasan kajian telah dikesan di mana 52,46% daripadanya adalah batu karang hidup, 21.31% batu karang beralga, 9.84% pasir dan 16.39% serpihan karang. Telah didapati daripada perubahan taburan batu karang bagi kawasan perairan Pulau Bidong 2007 dan 2011, taburan batu karang telah meningkat sebanyak 19.85%.