

OBJECT BASED IMAGE ANALYSIS FOR PREDICTIVE  
SUBSTRATE DISTRIBUTION MAP USING MULTIBEAM  
ECHO SOUNDER (MBES) AND BACKSCATTER  
BACKS IN BIDONG ISLAND ISLAND

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**OBJECT BASED IMAGE ANALYSIS  
FOR PREDICTIVE SUBSTRATE DISTRIBUTION MAP  
USING MULTIBEAM ECHO SOUNDER (MBES) AND  
BACKSCATTER IN BIDONG ISLAND**

**By**

**Norazianee binti Anuar**

**Research Report submitted in partial fulfillment o  
the requirements for the degree of  
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**FINAL YEAR PROJECT REPORT VERIFICATION**  
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It is hereby declared and verified that this project report titled  
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DECLARATION

I hereby declare that this dissertation

is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at UMT or other institutions. This report is submitted to the School of Marine and Environmental Sciences as partial fulfillment towards obtaining the **Bachelor's of Science ( Marine Science)** from School of Marine and Environmental Sciences, Universiti Malaysia Terengganu.

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## **ABSTRACT**

This study conducted to map a seafloor substrate and the area that was covered was in South West of Bidong Island which located in Terengganu. The first part aims is to delineate meaningful pattern of substrate distribution in backscatter and multibeam bathymetry using Object Based Image Analysis (OBIA) and the second part classifies type of seafloor substrate using multibeam bathymetry and backscatter data. An acquisition of acoustic for multibeam bathymetry, backscatter mosaic and ground truth data in South West of Bidong Island is used to characterize the sea floor substrate. Acoustic data of were collected R2Sonic 2020. For ground truth data, sample of sediment has been grab and classified based on its texture from triangle plot, thus classifying the sediment as coarse sand and very coarse sand. The data of mutibeam bathymetry, backscatter image and parameters from mutibeam were used for predicting the type of substrate that can be found on these seafloor. These combination of data were runs using Benthic Terrain Modeler (BTM), ISO Cluster unsupervised and Remote Sensing Object Based Image Analysis (RSOBIA). The data of substrate sample from ground truth used for this project to help in identifying the categories which produced from RSOBIA classification. From automated classification using RSOBIA, there were three classes was produced and these classes recognize based on ground truth information. The map produced by ROBIA also compared to the ISO cluster map to identify the differences of these classification technique. From the result, the type of substrate that predicted to dominant of mapped area was sandy grain. This study not only important to provide a map with useful information towards sea floor properties but also plays an important role in coastal management.

**ANALISIS IMEJ BERDASARKAN OBJEK UNTUK MERAMALKAN  
TABURAN SUBSRAT MENGGUNAKAN MULTIBEAM ECHO SOUNDER  
(MBES) DAN BACKSCATTER DI BIDONG**

**ABSTRAK**

Kajian ini dijalankan untuk memetakan substrat dasar laut dan kawasan yang terlibat adalah Barat Selatan Pulau Bidong yang terletak di Terengganu. Kajian ini adalah bertujuan untuk mendapat gambaran tentang corak taburan substrat berdasarkan data multibeam batimetri dan backscatter dengan menggunakan teknik analisis yang berdasarkan imej (OBIA) Tujuan lain juga ialah untuk mengklasifikasikan jenis substrat di dasar laut dengan menggunakan batimetri dan data backscatter. Data akustik yang telah diperolehi di kumpulkan dengan menggunakan Multibeam R2Sonic 2020. Manakala data untuk sample substrat, ia telah di klasifikasikan sebagai kasar dan sangat kasar berdasarkan plot segitiga. Data batimetri multibeam, imej backscatter dan parameter dari multibeam juga digunakan untuk meramalkan jenis substrat yang boleh didapati di dasar laut ini. Data ini diproses menggunakan Benthic Terrain Modeler (BTM), ISO Cluster dan RSOBIA. Data sampel substrat digunakan untuk projek ini untuk membantu dalam mengenal pasti kategori yang dihasilkan daripada pengelasan RSOBIA. Pengelasan automatik daripada RSOBIA, menghasilkan tiga kelas dan kelas ini dikenalpasti berdasarkan maklumat daripada data sample substrat. Peta yang dihasilkan oleh RSOBIA juga dibandingkan dengan ISO Cluster untuk mengenal pasti perbezaan teknik pengelasan berdasarkan keputusan yang diperolehi, jenis substrat yang diramalkan dominan dikawasan kajian ialah substrat berpasir. Kajian ini bukan sahaja penting untuk menyediakan peta dengan

maklumat tentang ciri-ciri lantai laut tetapi juga memainkan peranan penting dalam pengurusan pantai.