

SEDIMENTOLOGY AND SEDIMENT ACCRETION OF
PULAU CHE HANG, MANGROVE, SETIU
WETLAND, TERENGGANU

MURSAFULLAH ALI MUHAZIRI & ABD MANAN

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE OF SCIENCE AND
TECHNOLOGY MALAYSIA

2005

1100034641



LP 30 FST 2 2005



1100034641

Sedimentology and sediment accretion of Pulau Che Hamid Mangrove, Setiu Wetland, Terengganu / Nursaifullah Ali Muhazirn Abd Rahman.

PERPUSTAKAAN
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
21030 KUALA TERENGGANU

1100034641		

Lihat sebelah

HAK MILIK
PERPUSTAKAAN KUSTEM

**SEDIMENTOLOGY AND SEDIMENT ACCRETION OF PULAU CHE
HAMID MANGROVE , SETIU WETLAND , TERENGGANU**

BY

NURSAIFULLAH ALI MUHAZIRN B ABD MANAN

**A Project report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science
(Marine Biology)**

**FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY
MALAYSIA
2005**

1100034641

This project report should be cited as follows:

Nursaifullah A.M. 2005. Sedimentology and Sediment Accretion of Pulau Che Hamid Mangrove, Setiu Wetland, Terengganu. Undergraduate Thesis, Bachelor of Science (Marine Biology). Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia. 80pp

No part of this project report may be reproduced by any mechanical, photographic, or electronic process, or in the form of phonographic recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without written permission from the author and the supervisor(s) of the project



**DEPARTMENT OF MARINE SCIENCE
FACULTY OF SCIENCE AND TECHNOLOGY
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA**

**RESEARCH PROJECT REPORT APPROVAL
AND VALIDATION FORM I AND II**

I certified that the report of this final project entitled:

**SEDIMENTOLOGY AND SEDIMENT ACCRETION OF PULAU CHE HAMID
MANGROVE , SETIU WETLAND , TERENGGANU** by **NURSAIFULLAH ALI
MUHAZIRN B ABD MANAN** Matric No. **UK 6902** has been read and all the alteration
and correction recommended by examiners have been done . This final draft has submitted
and has been accepted as fulfillment of the requirement for **Bachelor of Science –
Marine Biology** . under the Faculty of Science and Technology , Kolej Universiti Sains
dan Teknologi Malaysia .

Approved by :

Supervisor

Name: Prof Dr Lokman Mohd Hussain

Cop Rasmi:

Date:

Head of Marine Science Department

Name:

Cop Rasmi:

Date:

ACKNOWLEDGEMENT

مبحرڈان محردالله امسب

Praise to Allah The Almighty , for His blessings which enabled me to complete my thesis . I would like to express my warmest appreciation to my supervisor , Prof. Dr. Mohd. Lokman Husain for all the invaluable guidance , support and constructive criticisms throughout this study . Also , it is my pleasure to thank Mr. Nasir Mohamad , Mr. Fathy Kamel , Mr. Karthigeyan , The staffs of the Institute of Oceanography (INOS) , Netloft Technical and Transportation Unit , University College of Science and Technology Malaysia (KUSTEM) for all guidance , advice , cooperation and providing the necessary facilities throughout the period of the project .

My deepest appreciation to my beloved parent Mr. Abdul Manan and Madam Zainab , my auntie and cousin (Miss Zainab and Miss Normala) , my siblings (Bab , Men , Amy , Ebi and Yen) for all of their loves , encouragement and understanding in the process of completing my studies . Last but not least , my special thanks to my buddies ; Hilmi , Hanis , Aty , Siti , Irni , Eno , Yanti , Amri , Hazreen , Epul , Edwin , Willy , Mamat , Eddie , Zen , Amal , Chenol , Muin and Roy for all of their moral supports and helps throughout the difficult and happy moments . Without all of you , this project will not be complete , Thank you very much !!! May Allah bless all of you .

NURSAIFULLAH ALI MUHAZIRN BIN ABD MANAN

Bachelor of Science (Marine Biology)

TABLE OF CONTENTS

CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	ix
LIST OF APPENDICES	x
ABSTRACT	xi
ABSTRAK	xii

CHAPTER 1

1.0 INTRODUCTION	1
1.1 Objectives	3

CHAPTER 2

2.0 LITERATURE REVIEW	4
2.1 Mangrove	4
2.2 Significance of Mangrove	6
2.3 Sedimentation in Mangrove	8
2.4 Source of Sediment	10
2.5 Sediment Particle Size	11

CHAPTER 3

3.0 METHODOLOGY	13
3.1 Description of Study Area	13
3.2 Sediment Collection and Analysis	18
3.2.1 Field Sampling	18
3.2.1.1 Installation of Sediment Markers and Transect Set Up	18
3.2.1.2 Surface Sediment Collection	19
3.2.1.3 Accretion Rate	19
3.2.2 Laboratory Analysis	21
3.2.2.1 Sediment Size Analysis	22
3.2.2.1.1 Dry Sieving Method	22
3.2.2.1.2 Moment Method	24

CHAPTER 4

4.0 RESULT	25
4.1 Particle size	25
4.1.1 Mean Size	27
4.1.2 Sorting	32
4.1.3 Skewness	37
4.1.4 Kurtosis	42
4.2 Accretion rate	47

CHAPTER 5

5.0 DISCUSSION	51
5.1 Pulau Che Hamid	51
5.2 Particle size	53
5.3 Mean Size	53
5.4 Sorting	57
5.5 Skewness	60
5.6 Kurtosis	63
5.7 Sediment Size Changes Towards Season	66
5.8 Accretion rate	67

CHAPTER 6

6.0 CONCLUSION	69
REFERENCES	71
APPENDICES	74
CURICULUM VITAE	80

LIST OF TABLES

Table	Title	Page
3.1	Coordinates of 30 sampling stations	15
4.1	Mean . sorting , skewness and kurtosis in non – monsoon season	25
4.2	Mean . sorting , skewness and kurtosis in monsoon season	26
4.3	Mean size for samples in non – monsoon season	28
4.4	Mean size for samples monsoon season	29
4.5	Sorting for samples in non – monsoon season	33
4.6	Sorting for samples in monsoon season	34
4.7	Skewness for samples in non – monsoon season	38
4.8	Skewness for samples in monsoon season	39
4.9	Kurtosis for samples in monsoon season	43
4.10	Kurtosis for samples in monsoon season	44
4.11	The accretion rate at Pulau Che Hamid Mangroves	47

LIST OF FIGURES

Figure	Title	Page
3.0	Location of study area	14
3.1	The accretion plate buried	20
3.2	The reading taken using a ruler to determine the accretion rate	21
3.3	The samples were taken out from the siever	23
3.4	Weighed the samples using electronic balance	23
4.1	Mean size in transect 1	30
4.2	Mean size in transect 2	30
4.3	Mean size in transect 3	31
4.4	Sorting in transect 1	35
4.5	Sorting in transect 2	35
4.6	Sorting in transect 3	36
4.7	Skewness in transect 1	40
4.8	Skewness in transect 2	40
4.9	Skewness in transect 3	41
4.10	Kurtosis in transect 1	45
4.11	Kurtosis in transect 2	45
4.12	Kurtosis in transect 3	46
4.13	The accretion rate in non – monsoon season	48
4.14	The accretion rate in monsoon season	48
4.15	The accretion rate at transect 1 in both season	49
4.16	The accretion rate at transect 2 in both season	49
4.17	The accretion rate at transect 3 in both season	50
5.0	Estuary near Pulau Che Hamid during non – monsoon season	52
5.1	An embankment that build at estuary near Pulau Che Hamid during monsoon season	52

5.2	Surface sediment mean size (ϕ) in non – monsoon season	56
5.3	Surface sediment mean size (ϕ) in monsoon season	56
5.4	Surface sediment sorting (ϕ) in non – monsoon season	59
5.5	Surface sediment sorting (ϕ) in monsoon season	59
5.6	Surface sediment skewness in non – monsoon season	62
5.7	Surface sediment skewness in monsoon season	62
5.8	Surface sediment kurtosis (ϕ) in non – monsoon season	65
5.9	Surface sediment kurtosis (ϕ) in monsoon season	65
5.10	Sorting vs mean size	66
5.11	Skewness vs mean size	67

LIST OF ABBREVIATIONS

ha	Hectare
%	Percentage
°C	Degree Celcius
g/cm ⁻²	Gram per centimeter square
mm/yr ⁻¹	Millimeter per year
km	Kilometer
m	Meter
cm	Centimeter
mm	Millimeter
μm	Micrometer
Φ	Phi

LIST OF APPENDIXES

Appendix	Title	Page
1	Figure show Pulau Che Hamid during low and high tides	74
2	Figure show how the tidal plate placed and accretion plate buried	75
3	Figure show all the step in dry sieving method	75
4	Instrument used in particle size analysis	76
5	Categories of mean , sorting , skewness and kurtosis	77
6	ANOVA (two ways) for mean , sorting , skewness and kurtosis	78

ABSTRACT

This study was conducted at Pulau Che Hamid Mangroves , Setiu Wetland . The surface sediments were collected from three transects (30 stations in June and November) . This study focused on accretion rate and also the surface sediment characteristic . The average of accretion rate value is 0.35 cm per month . The accretion rate varied between transects and also seasons . The mean size average is 1.22 Φ (medium sand) . The sorting , skewness and kurtosis average value is 0.94 Φ (moderately sorted) , 0.06 (symmetrical) and 3.16 Φ (extremely leptokurtic) .

ABSTRAK

Kajian ini telah dijalankan di kawasan hutan paya bakau Pulau Che Hamid , Hutan Paya Laut Setiu . Sampel sedimen di bahagian permukaan dikutip pada tiga buah transek yang berbeza (30 sampel dalam bulan Jun dan bulan November) . Kajian ini memfokuskan pada kadar sedimentasi dan ciri- ciri sedimen di bahagian permukaan . Purata kadar sedimentasi di dalam kawasan kajian ini ialah 0.35 cm per bulan . Kadar sedimentasi berbeza mengikut transek dan juga monsun . Purata nilai min ialah 1.22 Φ (pasir medium) . Purata nilai penyisihan , kepencongan dan kurtosis masing – masing adalah 0.94 Φ (sisihan sederhana sempurna) , 0.06 (simetrikal) and 3.16 Φ (tersangat leptokurtik) .