

DETERMINATION OF CURRENT CIRCULATION AND  
WAVE CHARACTERISTIC FROM REGIONAL  
OCEAN MODEL (MASNUM) NEAR PULAU TIOMAN

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**DETERMINATION OF CURRENT CIRCULATION AND WAVE CHARACTERISTIC  
FROM REGIONAL OCEAN MODEL (MASNUM) NEAR PULAU TIOMAN**

**By**

**NUR ZAFIRAH BINTI ZAPRI**

**Research Report submitted in partial fulfilment of  
the requirements for the degree of  
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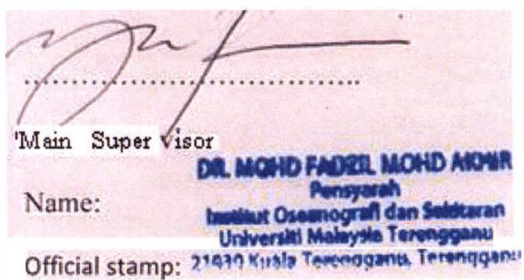
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**FINAL YEAR PROJECT REPORT  
VERIFICATION**

***PENAKUAN DAN PENGESAHAN  
LAPORAN***

It is hereby declared and verified that this project report titled **Determination of Current Circulation and Wave Characteristic from Regional Ocean Model (MASNUM) near Pulau Tioman** by **Nur Zafirah Binti Zapri**, matric no. **UK31603**, have been examined and all errors identified have been corrected. This report is submitted to the School of Marine and Environmental Sciences as partial fulfillment towards obtaining the **Bachelor of Science (Marine Science)** from School of Marine and Environmental Sciences, Universiti Malaysia Terengganu.

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Date: 26/5/2016

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Co- Supervisor

Name:

Official stamp:

Date: .....



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DECLARATION

It is hereby declared and verified that this project report titled **Determination of Current Circulation and Wave Characteristic from Regional Ocean Model (MASNUM) near Pulau Tioman** by **Nur Zafirah Binti Zapri**, matric no. **UK31603**, have been examined and all errors identified have been corrected. This report is submitted to the School of Marine and Environmental Sciences as partial fulfillment towards obtaining the **Bachelor of Science (Marine Science)** from School of Marine and Environmental Sciences, Universiti Malaysia Terengganu.

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	ii
<b>LIST OF TABLES</b>	v
<b>LIST OF FIGURES</b>	vi
<b>LIST OF ABBREVIATIONS</b>	vii
<b>LIST OF APPENDICES</b>	vi
<b>ABSTRACT</b>	viii
<b>ABSTRAK</b>	ix
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Introduction	1
1.2 Importance of Study	2
1.3 Objectives	3
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 South China Sea	5
2.2 Current Circulation in Southern South China Sea	6
2.3 Monsoon	7
2.4 Waves	8
2.5 Numerical Ocean Modelling	9
<b>CHAPTER 3: METHODOLOGY</b>	
3.1 Study Area- Pulau Tioman	10
3.2 Conceptual methodology	11
3.3 Marine Science and Numerical Modelling (MASNUM)	12



3.4	Model Validation	12
3.5	Wind data	12
	<b>CHAPTER 4: RESULTS</b>	13
4.1	Wave Characteristic	13
4.1.1	Northeast Monsoon- Wave Height	13
4.1.2	Southwest Monsoon-Wave Height	15
4.1.3	Wave pattern during the northeast monsoon and southwest monsoon	17
4.2	Current Circulation during transition monsoon period	19
4.3	Model data Validation	19
	<b>CHAPTER 5: DISCUSSION</b>	
5.1	Wave characteristic during the northeast monsoon and southwest monsoon.	22
5.2	Current circulation during transition monsoon period.	25
	<b>CHAPTER 6: CONCLUSION</b>	28
	<b>REFERENCES</b>	29
	<b>APPENDICES</b>	32
	<b>CURRICULUM VITAE</b>	33

## LIST OF TABLES

<b>Table</b>		<b>Page</b>
1	Average of surface current at from ADCP during 7 and 8 April	31

## LIST OF FIGURES

Figure	Page
2.1 South China Sea Bathymetry. Adapted from Pa'suya et al. (2014).	5
2.2 Figure 2: Surface current of South China Sea during Northeast Monsoon (a) and Southwest Monsoon (b) adapted from Morton &Blackmore (2001).	6
3.1 Map of Study Area at Pulau Tioman	10
3.2 Flow chart of conceptual methodology	11
4.1 Monthly mean wave height computed from MASNUM data Nov (a) and Dec (b)	13
4.2 Monthly mean wave height computed from MASNUM data Jan (a) Feb (b) and Mar (c)	14
4.3 Monthly mean wave height computed from MASNUM data May (a) and Jun (b) 2015	15
4.4 Monthly mean wave height computed from MASNUM data Jul (a) Aug (b) and Sep (c)	16
4.5 Monthly mean wave height (m) against Months.	18
4.6 Seasonally mean wave height computed from MASNUM data (A) Mean Wave Height of Northeast Monsoon and (B) Mean Wave Height of Southwest Monsoon	18
4.7 Monthly mean surface current in April simulated from MASNUM (a) and monthly mean surface current in October simulated from MASNUM (b)	19
4.9 Linear Regression Relation between MASNUM data and field data of current in 8 April 2014 (A) zonal current (U-component) (B) meridional current (V-component).	20
5.1 Time series of mean wave height and mean wind speed (a) Monthly mean wave height computed from MASNUM data (b) Monthly mean wind speed calculated from ECMWF reanalysis data.	22
5.2 Islands of the Seribuat Archipelago. Island names in large fonts represent the group of islands (Grismer et al., 2006).	24
5.3 Monthly wind pattern in April computed from MASNUM data	25
5.4 Monthly wind pattern in October computed from MASNUM data	26

## LIST OF ABBREVIATIONS

m/s	-	meter per second
m	-	meter
km	-	kilometer
ADCP	-	Acoustic Doppler Current Profiler
MASNUM	-	Marine Science and Numerical Modelling
NCEP	-	National Centres for Environmental Prediction
ECMWF	-	European Centre for Medium-Range Weather Forecasts
°N	-	Degree North (Latitude)
°E	-	Degree East (Longitude)

**DETERMINATION OF CURRENT CIRCULATION AND WAVE  
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NEAR PULAU TIOMAN**

**ABSTRACT**

Pulau Tioman is located in the South China Sea and influenced by monsoon seasons: northeast monsoon and the southwest monsoon. The seasonal wind monsoons have a major impact on the wave height and current circulation in the South China Sea including the Pulau Tioman. This project investigates the wave characteristic and current circulation around the Pulau Tioman water. The data from MASNUM model were used to simulate wave height and current circulation around the Pulau Tioman water for the period from November 2014 to October 2015 . The model was validated against limited available in-situ data from Acoustic Doppler Current Profiler (ADCP). European Centre for Medium-Range Weather Forecasts (ECMWF) Reanalysis wind data was used to identify the wind pattern over the water near Pulau Tioman. The simulation results were used to determine the changes of seasonal winds (northeast monsoon and southwest monsoon) on wave characteristics and current circulation during transition period around the Pulau Tioman. April and October represented as the transition period in this project. The result show that this area has different wave characteristic and current circulation in response to monsoon changes. During the northeast monsoon, The mean wave height during the northeast monsoon was 1.15 m while in the southwest monsoon, the wave height was 0.42 m. The mean wave height during the northeast monsoon was higher than mean wave height during the southwest monsoon. The current around Pulau Tioman also shows seasonality, the dominant current flows southward during April and northward during October.

**PENENTUAN PEREDARAN ARUS DAN CIRI OMBAK DARIPADA  
'REGIONAL OCEAN MODEL' (MASNUM) BERDEKATAN PULAU  
TIOMAN**

**ABSTRAK**

Pulau Tioman terletak di Laut China Selatan dan dipengaruhi oleh angin monsun: monsun timur laut dan monsun barat daya. Angin monsun bermusim dan memberi kesan yang besar kepada ketinggian ombak dan peredaran arus di Laut China Selatan termasuk Pulau Tioman. Kajian projek ini tentang ciri ombak dan peredaran arus di perairan Pulau Tioman. Data daripada model MASNUM digunakan untuk mensimulasikan ketinggian ombak dan peredaran arus di sekitar perairan Pulau Tioman bagi tempoh November 2014 hingga Oktober 2015. Model ini di disahkan dengan in-situ data daripada 'Acoustic Doppler Current Profiler (ADCP)'. Data angin analisis semula 'European Centre for Medium-Range Weather Forecasts (ECMWF)' telah digunakan untuk mengenal pasti corak angin di atas perairan berhampiran di Pulau Tioman. Keputusan simulasi digunakan untuk menentukan perubahan angin monsun (monsun timur laut dan monsun barat daya) terhadap ciri ombak dan peredaran arus ketika monsun peralihan di sekitar Pulau Tioman. April dan Oktober mewakili tempoh peralihan monsun di dalam projek ini. Hasil dapatan kajian menunjukkan bahawa kawasan ini mempunyai ketinggian ombak yang berbeza dan peredaran arus yang bertindak balas terhadap perubahan monsun. Ketinggian ombak ketika monsun timur laut adalah 1.15 m manakala ketinggian ombak ketika monsun barat daya adalah 0.42 m. Purata ketinggian ombak secara bulanan semasa monsun timur laut adalah lebih tinggi berbanding purata ketinggian ombak secara bulanan semasa monsun barat daya. Perairan Pulau Tioman menunjukkan aliran arus yang menuju ke selatan ketika April manakala ketika Oktober pula arus bergerak ke arah utara.