MONSOON EFFECTS ON PRIMARY PRODUCTIVITY, CHLOROPHYLL-*a* AND TOTAL SUSPENDED SOLIDS (TSS) IN SETIU LAGOON, TERENGGANU

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2008

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MONSOON EFFECTS ON PRIMARY PRODUCTIVITY, CHLOROPHYLL-A AND TOTAL SUSPENDED SOLIDS (TSS) IN SETIU LAGOON, TERENGGANU.

By

Yip Li Voon

Research Report submitted in partial fulfillment of
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PENGAKUAN DAN PENGESAHAN LAPORAN

PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: Monsoon Effects on Primary Productivity, Chlorophyll-a and Total Suspended Solid (TSS) in Setiu Lagoon, Terengganu. Oleh Yip Li Voon, No.Matrik UK12862 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sains Biologi Marin, Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

%	-	Percentage
‰ @ ppt	-	Part per thousand
^{o}C	-	Degree centigrade
APHA	-	American Public Health Association
BOD	-	Biological oxygen demand
CO_2	-	Carbon dioxide
Conc.	-	Concentrated
DO	-	Dissolved oxygen
DOE	-	Department of Environment
G	-	Gross photosynthetic rate
GFC	-	Glass microfibre filters
GPS	-	Global Positioning System
M	-	Molarity
mg/L^{-1}	-	Milligram per liter
Mg/m^{-3}	-	Milligram per cube
$mgC.m^{-3}.hr^{-1}$	-	Milligram carbon per metre cube per hour
N	-	Net photosynthetic rate
N	-	normality
nm	-	Nanometer
pH	-	Potential of hydrogen
R	-	Respiration rate
Stdev	-	Standard deviation
TSS	-	Total suspended solids
µm	-	Micrometer
$\mu mol.m^{-2}.s^{-1}$		Micrometer per metre cube per second

LIST APPENDIX

ABSTRACT

This study aims to determine net photosynthetic rate, chlorophyll-a and total suspended solids in Setiu lagoon. Three samplings were conducted: 8th September 2007 (South-West monsoon), 21 October 2007 (Inter-monsoon) and 29th Dicember 2007 (North-East monsoon). Fourteen sampling stations were set around the Setiu lagoon. The changing of monsoon was found to be the most important factor that affects the water quality in Setiu lagoon. Thus Winkler's dissolved oxygen method and Light-dark bottles were using to determine the primary productivity, spectrophotometer was use to measure the concentration of chlorophyll-a in water sample and filtration of water sample and the constant weight of residue that trap in filter paper to determine the total suspended solid. The mean values of net photosynthetic rate for 1st, 2nd and 3rd sampling were 103.91 $mg.C.m^{-3}.hr^{-1}$, 31.25 $mg.C.m^{-3}.hr^{-1}$ and 36.72$mg.C.m^{-3}.hr^{-1}$ respectively. The light intensity is the major factor. Moreover the mean values of chlorophyll-a during 1st, 2nd and 3rd sampling were 0.908$mg.m^{-3}$, 0.938 $mg.C.m^{-3}.hr^{-1}$ and 0.441 $mg.C.m^{-3}.hr^{-1}$ respectively. It is due to the greater volume of freshwater during North-east monsoon, low salinity and dilution of nutrient of freshwater cause the lower chlorophyll-a level. Finally the mean values of total suspended solids for 1st, 2nd and 3rd sampling were 25.15$mg.L^{-1}$, 9.05$mg.L^{-1}$and 27.5$mg.L^{-1}$ respectively. The total suspended solids in Setiu lagoon didn't exceed the interim standard from DOE. Thus the TSS in Setiu lagoon still in the safety level.

Kajian Kesan Monsoon atas Produktiviti Primer, Kandungan Klorofil-a dan Jumlah Pepejal Terampai Di Lagun Setiu.

ABSTRAK

Kajian ini bertujuan untuk mengukur kadar fotosintesis bersih, kandungan klorofil-a dan jumlah pepejal terampai di lagun Setiu. Tiga kali penyampelan telah dijalankan pada 8th September 2007 (Monson Barat Daya), 21 Oktober 2007 (Antara monson) and 29th Disember 2007 (Monson Timur Laut). Empat belas stesen telah ditetapkan di lagun Setiu untuk kajian tersebut dijalankan. Kaedah Winkler's dissolved oxygen dan Keadah Light-dark bottles telah dipilih untuk mengukur produktiviti primer, kaedah UV-spectrophotometer untuk menentu kandungan klorofil-a dalam air, dan penapisan dan berat pepejal terampai yang terperangkap dalam kertas turas. Nilai min bagi kadar photosintesis bersih bagi penyempalan pertama, kedua dan ketiga ialah 103.91 mg.C.m^{-3}.hr^{-1}, 31.25 mg.C.m^{-3}.hr^{-1} and 36.72mg.C.m^{-3}.hr^{-1} masing-masing. Kadar keamatan cahaya merupakan factor utama yang mejejaskan kadar photosintesis bersih. Selain itu, nilai min bagi kandungan klorofil-a di lagun Setiu bagi penyempalan pertama, kedua dan ketiga ialah 0.908mg.m^{-3}, 0.938 mg.C.m^{-3}.hr^{-1} and 0.441 mg.C.m^{-3}.hr^{-1} masing-masing. Hal ini adalah disebabkan oleh penambahan air hujan yang banyak semasa musim monsun Timur Laut, kemasinan air laut yang rendah, pencairan nutrient oleh air hujan menyebabkan kandungan klorofil-a mejadi kurang. Akhir sekali, nilai min bagi jumlah pepejal terampai bagi penyempalan pertama, kedua dan ketiga ialah 25.15mg.L^{-1},

9.05mg.L $^{-1}$and 27.5mg.L^{-1} masing-masing. Jumlah pepejal terampai di lagun Setiu adalah tidak melebihi tahap yang telah ditetapkan oleh DOE.