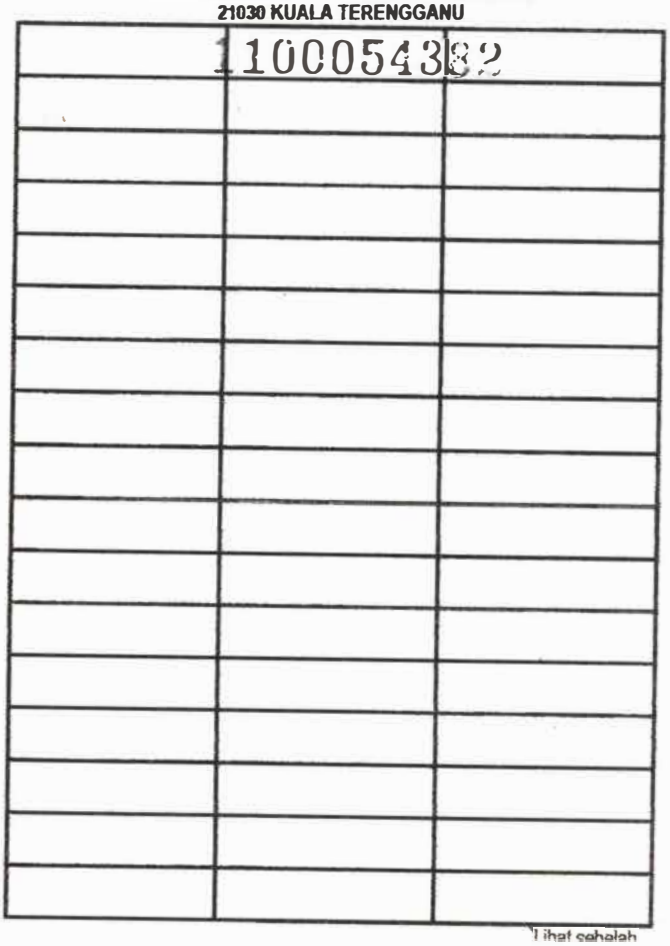
Total organic carbon (TOC) and biological oxygen demand (BOD) in water and sediment of Setiu Lagoon, Terengganu, South China Sea / Tan Hong Hock.



TOTAL ORGANIC CARBON(TOC) AND BIOLOGICAL OXYGEN DEMAND(BOD) IN WATER AND SEDIMENT OF SETIU LAGOON, TERRENGGANU, SOUTH CHINA SEA

By

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UNIVERSITI MALAYSIA TERENGGANU

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PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Total Organic Carbon And Biological Oxygen Demand(BOD) In Water And Sediment Of Setiu Lagoon, Terengganu, South China Sea oleh ***Tan Hong Hock***, No. Matrik ***UK9321*** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi ***Ijazah Sarjana Muda Sains Sains Samudera***, Fakulti Maritime dan Sains Marine, Universiti Malaysia Terengganu.

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LIST OF ABBREATIONS

µm	-	Micrometer
‰	-	Part per thousand
ALPHA	-	American Publish Health Association
BOD	-	Biological Oxygen Demand
$C_6H_{12}O_6$	-	Carbohydrate
CH_4	-	Methane
Cl	-	Chlorine
CO_2	-	Carbon Dioxide
COD	-	Chemical Oxygen Demand
DO	-	Dissolved Oxygen
DOC	-	Dissolved organic carbon
DOE	-	Department of Environment
FW	-	Formula Weight
GFC	-	Glass Microfibre Filters
HCl	-	hydrochloride acid
M	-	Molar
Max	-	Maximum
mg C/g	-	Milligram carbon per gram
mg/L	-	Milligram per liter
Min	-	Minimum
ml	-	Milliliter
MW	-	Molecular weight
N	-	Normality
NO_2^-	-	Nitrite
NO_3^-	-	Nitrate
NPOC	-	Non-purgeable organic carbon
O_2	-	Oxygen
°C	-	Degree Celsius
OM	-	Organic matter
p	-	Probability
POC	-	Purgeable organic carbon
ppm	-	part per million
S	-	Sulphur
SS	-	Suspended Solid
St	-	Station
Std. Dev.	-	Standard Deviation
TC	-	Total carbon
TIC	-	Total inorganic carbon
TOC	-	Total Organic Carbon
WQS	-	Water Quality Standard
µM	-	Micromole

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ABSTRAK

Taburan jumlah Organik Carbon(TOC) and Biological Oxygen Demand(BOD) dalam air dan sediment di Setiu Lagoon telah dikaji. Tiga lawatan dilakukan ke atas empat belas stesen telah ditentukan. Sampling pertama, kedua dan ketiga dilakukan pada 13 September 2006, 12 October 2006 dan 14 December 2006. Purata nilai and sisihan piawai bagi taburan TOC dalam sample air semasa sampling pertama, kedua dan ketiga ialah 48.869±19.483mg C/L, 82.711±25.370mg C/L dan 87.178±13.653mg C/L masing-masing. Purata nilai and sisihan piawai bagi taburan TOC dalam sample sediment semasa sampling pertama, kedua dan ketiga ialah 7.367±5.864mg C/g, 9.445±6.311mg C/g dan 6.946±4.880mg C/g masing-masing. Purata nilai and sisihan piawai bagi taburan BOD_5 dalam sample air semasa sampling pertama, kedua dan ketiga ialah 0.990±0.345mg/L, 1.495±0.352mg/L dan 0.668±0.191mg/L masing-masing. Purata nilai and sisihan piawai bagi taburan biodegradasi organik carbon dalam sample sediment semasa sampling pertama, kedua dan ketiga ialah 0.396±0.138mg C/L, 0.598±0.141mg/L dan 0.267±0.076mg/L masing-masing. Purata nilai and sisihan piawai bagi taburan tak-biodegradasi organik carbon dalam sample air semasa sampling pertama, kedua dan ketiga ialah 0.056±0.044mgC/g, 0.140±0.048mgC/g dan 0.060±0.023mgC/g masing-masing. Purata nilai and sisihan piawai bagi taburan tak-biodegradasi organik carbon dalam sample sediment semasa sampling pertama, kedua dan ketiga ialah 47.858±21.637mgC/L, 82.327±23.712mgC/L dan 89.133±12.415mgC/L masing-masing. Purata nilai and sisihan piawai bagi taburan tak-iodegradasi organik carbon dalam sample sediment semasa sampling pertama, kedua dan ketiga ialah 7.526±6.265mgC/g, 9.304 ±6.284mgC/g dan 6.885±4.869mgC/g. Musim monsoon telah mengakibatkan perningkatan bacaan TOC dan BOD_5. Akan tetapi pasir bar buatan manusai telah mengakibatkan peningkat bacaan TOC dan BOD5 yang lebih tinggi berbanding kesan monsson. Akhirnya, Setiu Lagoon masih berada dalam keadaan yang tidak tercemar.

ABSTRACT

The distribution of Total Organic Carbon (TOC) and Biological Oxygen Demand (BOD) in water and sediment of Setiu Lagoon were studied. Three sampling field trips were conducted on the established fourteen stations. The first, second and third sampling was carried out on 13 September 2006, 12 October 2006 and 14 December 2006 respectively. The mean and standard deviation values of TOC in water sample during the first, second and third sampling periods for Setiu lagoon stations were 48.869±19.483mg C/L, 82.711±25.370mg C/L and 87.178±13.653mg C/L respectively. The mean and standard deviation values of TOC in sediment during the first, second and third sampling periods for the lagoon stations were 7.367±5.864mg C/g, 9.445±6.311mg C/g and 6.946±4.880mg C/g respectively. During first, second and third sampling periods, the mean and standard deviation values BOD_5 values for water sample were 0.990±0.345mg/L, 1.495±0.352mg/L and 0.668±0.191mg/L respectively. First, second and third sampling periods for biodegradable organic carbon for water sample were 0.396±0.138mg C/L, 0.598±0.141mg/L, 0.267±0.076mg/L respectively. The mean and standard deviation values of biodegradable organic carbon for sediment samples during first, second and third sampling periods were 0.056±0.044mgC/g, 0.140±0.048mg C/g, 0.060±0.023mg C/g respectively. In addition, The mean and standard deviation values for non-biodegradable organic carbon for water sample during the first, second and third sampling periods for Setiu lagoon stations were 47.858±21.637mg C/L, 82.327±23.712mg C/L, 89.133±12.415mg C/L. While the mean and standard deviation values for non-biodegradable organic carbon in sediment samples during the First, second and third sampling periods for Setiu lagoon stations were 7.526±6.265mg C/g, 9.304 ±6.284mg C/g, 6.885±4.869mg C/g. During northeast monsoon has greatly increase the TOC and BOD_5 reading. However the man made sand bar had influences TOC and BOD5 reading compare to monsoon effect. Lastly, Setiu Lagoon is still consider as an unpolluted aquatic system.