

THE UNIVERSITY OF MICHIGAN LIBRARY OF SEAS
ANN ARBOR, MICHIGAN, SOUTH ANN ARBOR, MI

THE UNIVERSITY OF MICHIGAN LIBRARY

THE UNIVERSITY OF MICHIGAN LIBRARY
ANN ARBOR, MICHIGAN, SOUTH ANN ARBOR, MI

1100042342

LP 35 FST 4 2006



1100042342
Hydrocarbons in water and sediment of Setiu
Lagoon, Terengganu, South China Sea / Radha Devi d/o
Taiwasakayam.



PERPUSTAKAAN
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
21030 KUALA TERENGGANU

1100042342		

Lihat sebelah

HAK MILIK
PERPUSTAKAAN KUSTEM

**HYDROCARBONS IN WATER AND SEDIMENT OF SETIU LAGOON
TERENGGANU, SOUTH CHINA SEA**

By

Radha Devi D/O Taiwasakayam

**Research Report submitted in partial fulfillment of
the requirements of the degree of
Bachelor of Science (Marine Science)**

**Department of Marine Science
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005/2006**

1100042342

This project should be cited as:

Radha,D.T.2006. Hydrocarbons in water and sediment of Setiu Lagoon, Terengganu, South China Sea.Undergraduate thesis, Bachelor of Science in Marine Science, Faculty of Science and Technology, Kolej Universiti Sains Dan Teknologi Malaysia.

No part of this project may be reproduced by any mechanical, photographic, or electronic process, or in the form of phonographic recording, nor it 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 of the project.



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

APPROVAL AND CERTIFICATION FORM
RESEARCH PROJECT I AND II

I certify that the research report entitled: Total Hydrocarbons in water and sediment of Setiu Lagoon, Kuala Terengganu, South China Sea by RADHA DEVI D/O TAIWASAKAYAM, Matric no UK7832 have been read and corrections recommended by the examiners have been done. This research report is submitted to the department of Marine Science in partial fulfillment of the requirements for the degree of Bachelor of Science, Faculty of Science and Technology Malaysia.

Approved by:

Supervisor **PROF. DR. LAW AH THEEM**
PENSYARAH
Jabatan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu

Date : 21/5/06

Head of Department
Name : **PROF. MADYA DR. HJ. ROSNAN**
Ketua
Jabatan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Date : _____

ACKNOWLEDGEMENT

First of all I would like to thank the god who gives me strength to finish this thesis. My heart full thanks will go to my supervisor Prof. Dr.Law Ah Theem. He gave me a lot of guidance by offering me with valuable information, advice, comments and criticism. Besides this, my credit for the accomplishment of this thesis goes to Dr.Nor Antonina who guides me through out the process of thesis writing and also for her advices.

At this moment I cant forget Prof. Dr.Law Ah Theem's postgraduate students ; Mr.Yong Jaw Chuen, Mr.Chin Kam Yew, Chuah Lai Fatt and Mr.Yew Wooi Meng for their assistance and support. They had spent their energy and time for me whenever I need their help. From my bottom of my heart I would like to thanks for their help.

I also can't forget my friends who help me a lot to finish this thesis successfully. Especially Ms.Uwarani, Ms.Ambika Devi, Ms.Malini, Ms.Sumitha and Ms.Suzanne. They had helped me a lot during my sampling trip and also during my lab work. They had given me support and unselfish sacrifice of time and effort. I would also like to convey my gratitude to all my family members. They had given me continuous support and ensured success in completing my thesis. My acknowledgement also goes to all the Oceanography Laboratory assistants who help me while conducting this study.

Finally, I am very happy and gratefull for the unlimited support,help and guidance from all those mentioned above. Again from bottom of my heart I would like to thank all those mentioned above. Thank You.

Radha Devi D/O Taiwasakayam (UK7832)

ABSTRAK

Salah satu faktor utama pencemaran laut ialah minyak. Dalam setahun, setengah daripada jumlah kapal yang terdapat didunia akan melalui perairan Melaka dan seterusnya menghala ke laut China Selatan. Tambahan pula bahagian timur semenanjung Malaysia adalah salah satu tempat bagi penghasilan minyak yang aktif. Oleh itu, negeri Terengganu sangat peka kepada pencemaran minyak. Kajian in telah dijalankan di Setiu Lagoon, Terengganu yang terletak di Laut China Selatan. Terdapat 14 station yang dikaji pada monsoon yang berbeza. Kajian ini dijalankan ketika bukan (Ogos) monsoon timur laut, semasa (Disember) dan sebelum (Oktober) monsoon timur laut.

Jumlah hydrocarbon dalam sampel air dan sediment telah ditentukan. Selain itu, jumlah kealkalian dalam sample air juga dikaji. Julat kelakalian yang diperolehi ialah 8.00 ± 2.00 hingga 164.67 ± 4.51 . Julat hidrokarbon yang diperolehi dalam sample air ialah $26.82 \mu\text{g/L}$ dan $432.18 \mu\text{g/L}$, $58.05 \mu\text{g/L}$ dan $426.05 \mu\text{g/L}$ serta $74.39 \mu\text{g/L}$ dan $348.91 \mu\text{g/L}$ ketika persampelan pertama, kedua dan ketiga masing-masing. Julat jumlah hidrokarbon dalm sedimen yang diperolehi ketika persampelan pertama adalah 7.241mg/Kg dan $18.391, 17.32\text{mg/Kg}$ dan 808.05mg/Kg ketika persampelan kedua dan 8.08mg/Kg dan 690.04mg/Kg di persampelan ketiga.

Keputusan yang diperolehi membuktikan bahawa air dan sediment di Setiu lagun tercemar dengan hidrokarbon. Air dan sediment di station 7 adalah yang paling tercemar dengan hidrokarbon. Julat hidrokarbon yang dicatatkan bagi air dan sediment ialah $402.38 \mu\text{g/L}$ dan 838.83mg/Kg masing-masing.

Walaupun monsoon timur laut tidak sangat memberi kesan kepada bacaan hidrokarbon tetapi kandungan hydrokarbon berbeza antara stesen di lagun itu. Kandungan hidrokarbon dalam air ketika musim monsoon timur laut menurun manakala kandungan hidrokarbon dalam sediment meningkat ketika musim monsoon ini.

ABSTRACT

One of the major pollutants in this world is oil. More than half of the world's annual merchant fleet tonnage passes through the Straits of Malacca, with the majority continuing on into the South China Sea. In addition the east coast of Peninsular Malaysia is an active site for offshore oil production. Therefore, Terengganu is vulnerable to oil pollution. The study was conducted in Setiu Lagoon, Terengganu, South Chin Sea. .14 stations were established at different monsoon seasons. The samplings were carried out at Southwest monsoon(August), pre northeast monsoon (October) and during northeast monsoon (December).

Total hydrocarbon in water and sediment of Setiu Lagoon was studied. Besides this, total alkalinity in water was also determined. The range of total alkalinity was between 8.00 ± 2.00 and 164.67 ± 4.51 . Besides this, the mean value of total hydrocarbon in water during first sampling was range between $26.82 \mu\text{g/L}$ and $432.18 \mu\text{g/L}$, $58.05 \mu\text{g/L}$ and $426.05 \mu\text{g/L}$ during second sampling, and $74.39 \mu\text{g/L}$ and $348.91 \mu\text{g/L}$ during third sampling respectively. The mean total hydrocarbon content in sediment was in a range of 7.241mg/Kg and 1018.391mg/Kg during first sampling, 17.325mg/Kg and 808.05mg/Kg during second sampling and 8.08mg/Kg and 690.04mg/Kg in third sampling.

The results indicate that the water and sediment were polluted with hydrocarbon especially at station 7. The mean value of total hydrocarbon for water and sediment at station 7 was 402.38 $\mu\text{g/L}$ and 838.83mg/Kg respectively.

Although there was no significant effect of monsoon seasons on the sampling conducted ($p < 0.05$) but there was significant different ($p > 0.005$) on the hydrocarbon content between stations in the lagoon. The concentration of hydrocarbon in water during was lower than that found in the southwest monsoon and Intermonsoon. Where else, the hydrocarbon content in the sediment increases during northeast monsoon.