

**MONSOON EFFECTS ON DISTRIBUTION OF HYDROCARBONS
IN WATER AND SEDEIMENT OF SETIU LAGOON**

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By

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**Research Report submitted in partial fulfillment of
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**Department of Marine Science
Faculty of Maritime Studies and Marine Science
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UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk Monsoon Effects on Distribution of Hydrocarbons in Water and Sediment of Setiu Lagoon oleh Liew Siew Hua, No.Matrik UK 12789 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Biologi Marine, Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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ABBREVIATIONS

°C	= degree Celsius
%	= percentage
g	= gram
m	= meter
ml	= milliliter
µg	= microgram
nm	= nanometer
ppm	= part per million
ppb	= part per billion
g/L	= gram per liter
m/s	= meter per second
mg/kg	= milligram per kilogram
mg/L	= milligram per liter
TOC	= total organic carbon
µg/ml	= microgram per milliliter
µg/L	= microgram per liter
WSF	= Water soluble fraction
P	= possibility

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ABSTRACT

Concentration and distribution of hydrocarbons has been examined in water and surface sediment samples from Setiu Lagoon. The effects of monsoon seasons on the distribution of hydrocarbons in water and sediment of Setiu Lagoon were also determined. There are 14 sampling sites in each sampling and 3 times of sampling trips were conducted. Extraction method was used to determine the concentration of hydrocarbons in the samples. Mean value for hydrocarbons concentration in the water was 78.44 ppb, in the range of 47.08 ppb to 125.09 ppb. Mean value for hydrocarbons concentration in the sediment was 428.7 mg/kg, in the range of 11.86 mg/kg to 1718.56 mg/kg. The concentration of hydrocarbons in sediment was found to exceed the safety level of 100 mg/kg (Marchand *et al.*, 1982, cited by Law and Rahimi, 1986).

Result of statistical analysis showed that the concentration and distribution of hydrocarbons in water and sediment of Setiu Lagoon were not effected by the changes of monsoons ($P>0.05$). Anyway, hydrocarbons content in the samples of Setiu Lagoon increased during the occurrence of Northeast Monsoon. In comparison to others adjacent waters of the South China Sea, Setiu Lagoon showed higher level of hydrocarbons content. This is most probably due to the aquaculture, fishing, small scale industries, small scale farming, boat building and eco-tourism activities presence in Setiu. The presence of hydrocarbons in Setiu Lagoon may disturb the pristine marine ecosystem in over there.

KESAN-KESAN MONSON KE ATAS KEPEKATAN HIDROKARBON DI DALAM AIR DAN SEDIMEN SETIU LAGOON, TERENGGANU

ABSTRAK

Kepekatan hidrokarbon di dalam air dan sedimen di Lagun Setiu telah dianalisa. Di samping itu, kesan-kesan musim monsun terhadap taburan hidrokarbon di dalam air dan sediment di Lagun Setiu juga ditentukan. Dalam kajian ini, sebanyak 14 buah tapak penyampelan sementara 3 kali penyampelan dijalankan. Kaedah pengekstrakkan digunakan untuk menentukan kandungan hidrokarbon di dalam sampel-sampel. Purata jumlah kepekatan hidrokarbon di dalam air ialah 78.44 ppb dalam lingkungan 47.08 ppb hingga 125.09 ppb. Purata kepekatan hidrokarbon di dalam sedimen ialah 428.7 mg/kg dalam lingkungan 11.86 mg/kg hingga 1718.56 mg/kg. Kepekatan hidrokarbon di sedimen telah mencecah tahap keselamatan iaitu melebihi 100 mg/kg (Marchand *et al.*, 1982, cited by Law and Rahimi, 1986).

Keputusan analisa statistik menunjukkan kepekatan hidrokarbon di dalam air dan sedimen tidak dipengaruhi oleh musim monsun ($P > 0.05$). Walaubagaimanapun, kepekatan hidrokarbon di dalam sampel-sampel Lagun Setiu merekodkan penambahan semasa berlakunya Monson Timur Laut. Kepekatan hidrokarbon di Lagun Setiu lebih tinggi berbanding kawasan Laut China Selatan lain yang berdekatan. Keadaan ini mungkin disebabkan adanya aktiviti-aktiviti akuakultur, perikanan, industri mikro, pekebunan, eko-pelancongan dan pembinaan kapal di Kawasan Setiu. Kehadiran hidrokarbon di Lagun Setiu berpotensi untuk menrosakkan ekosistem marin yang sihat di Lagun Setiu.