

A PRELIMINARY STUDY OF SPECTRAL LIGHT ATTENUATION AND THE
ABSORPTION COEFFICIENT OF COLORED DISSOLVED ORGANIC
MATTER (CDOM) IN THE COASTAL WATER OF KUALA TERENGGANU

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**JABATAN SAINS MARIN
FAKULTI PENGAJIAN MARITIM DAN SAINS MARIN
UNIVERSITI MALAYSIA TERENGGANU**

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

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Preliminary Study of Spectral Light Attenuation and the Absorption Coefficient of Colored Dissolved Organic Matter (CDOM) in the Coastal Water of Kuala Terengganu oleh Hazwani bt Mohd Said, No.Matrik UK 12196 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Sains Samudera), Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATION

1) CDOM	Colored dissolved organic matter
2) TSS	Total suspended solid
3) IOPs	Inherent optical properties
4) AOPs	Apparent optical properties
5) K_d	Diffuse attenuation coefficient
6) R	Irradiance reflectance
7) R_{rs}	Remote sensing reflectance
8) UV radiation	Ultraviolet radiation
9) a	Absorption coefficient
10) b	Scattering coefficient
11) E_u	Upwelling irradiance an
12) E_d	Downwelling irradiance
13) $0'$	Null depth
14) L_u	Upwelling above the water
15) F_0	Extra terrestrial
16) HCL	Hydrochloric acid
17) d	Depth
18) dz	Depth different
19) $a_{cdom}(\lambda)$	CDOM absorption coefficient
20) $OD_{cdom}(\lambda)$	Optical density spectra
21) $a_y(440)$	Absorption measured at 440nm

- | | |
|--------------|--------------------|
| 22) S | Slope coefficient |
| 23) R^2 | Regression value |
| 24) nm | Nanometer |
| 25) m^{-1} | Unit of absorption |

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ABSTRAK

Kajian ini telah dijalankan bagi mengetahui dan menganggar taburan bahan organik terlarut (CDOM) di sekitar perairan Kuala Terengganu berdasarkan kaitan hubungan dengan ciri-ciri cahaya. Kajian ini merupakan konsep asas remote sensing yang boleh digunakan untuk membina persamaan remote sensing yang baru. Persamaan yang diperolehi boleh digunakan untuk menganggar kepekatan CDOM yang terkandung di dalam air laut. Penyempelan telah dilakukan pada 23 Oktober 2007 hingga 27 Oktober 2007 di 24 stesen. Didalam kajian ini, AOP radiometrik parameter seperti sinaran pasuan naik dan pekali pelemahan peresapan telah diukur dikawasan lapangan. Penyerapan CDOM tinggi dikawasan berdekatan daratan dan tinggi di kawasan laut dalam. Nilai penyerapan CDOM yang tertinggi terletak diantara 0.016 m^{-1} hingga 0.64 m^{-1} . Keputusan menunjukkan CDOM tidak boleh dianggar berdasarkan nilai K_d . Didapati kesemua panjang gelombang menunjukkan hubungan yang lemah dengan CDOM. Nilai regerasi (R^2) bagi hubungan polinomial yang diperolehi hanyalah 0.61 iaitu pada panjang gelombang 650m. Keputusan yang diperolehi menunjukkan bahawa sukar untuk menganggar kepekatan CDOM berdasarkan ciri optik dikawasan perairan Kuala Terengganu.

ABSTRACT

This study was conducted in order to estimate and characterize the CDOM in the coastal water of Kuala Terengganu based on the understanding of light properties. This study dealt with the basic concept of remote sensing that can help in developing the remote sensing algorithms for seawater constituent estimation. Sampling was carried out at 24 stations on 23rd October 2007 to 27th October 2007. In this study, AOP radiometric parameters such as upwelling irradiance and diffuse attenuation coefficient (K_d) were measured during field measurements. The highest CDOM absorption was found at nearshore stations and the lowest CDOM absorption at offshore station is ranged between 0.0016m^{-1} to 0.64m^{-1} . Results demonstrated that CDOM cannot be estimated accurately using the K_d . All wavelengths were found to have poor relationship with CDOM. The highest polynomial regression coefficient (R^2) was only 0.65 at wavelength 650nm. The results demonstrated the difficulty in estimating the CDOM concentration using the optical properties at the coastal water of Kuala Terengganu.