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The assessment of apparent optical properties of Chlorophll-a in Kuala Terengganu coastal waters / Noor Maiza Mohd Razali.

# THE ASSESSMENT OF APPARENT OPTICAL PROPERTIES OF CHLOROPHYLL-a IN KUALA TERENGGANU COASTAL WATERS

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**2007**

# THE ASSESSMENT OF APPARENT OPTICAL PROPERTIES OF CHLOROPHYLL-a IN KUALA TERENGGANU COASTAL WATERS

By

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

Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITI MALAYSIA TERENGGANU
2007

**JABATAN SAINS SAMUDERA**
**FAKULTI PENGURUSAN MARITIM DAN SAINS MARIN**
**UNIVERSITI MALAYSIA TERENGGANU**

## RESEARCH PROJECT REPORT APPROVAL AND VALIDATION FORM I AND II

I certify that the report of this final year project entitled:

**THE ASSESSMENT OF APPARENT OPTICAL PROPERTIES OF CHLOROPHYLL-A IN KUALA TERENGGANU COASTAL WATER** by **NOOR MAIZA BT MOHD RAZALI** No. Matrics: **UK 10776** has been read and all the alteration and correction recommended by examiners have been done. This report has been submitted and accepted as fulfillment of the requirement for **Bachelor of Science-Marine Science,** under the Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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DEDICATION:

THIS THESIS IS DEDICATED TO MY PARENTS, BROTHER AND SISTERS AND ALSO TO MY DEAREST. THANK YOU FOR ALL OF YOUR SUPPORTS AND ENCOURAGEMENTS.

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## ABSTRACT

This study was concentrated on turbid and semi turbid multicomponental coastal waters. The component of Apparent Optical Properties(AOP) were determined during the field sampling in Kuala Terengganu coastal water. The relationship between Remote Sensing Reflectance *($R_{rs}$)* and Diffuse Attenuation Coefficient*($K_d$)* with the concentration of Chlorophyll-a was succesfully studied. The peak wavelength to best detect the Chlorophyll-a concentration from station 1-22 was 509nm and 532nm. Furthermore, the highest value of $R^2$ that is 0.649 showed that there was correlation between the $R_{rs}$ component and the concentration of Chlorophyll-a at 509nm wavelength compared to other wavelength. While for the other component, $K_d$, the visible region (443, 490, 510, 532, 555, and 647nm) showed a significant correlation with the concentration of Chlorophyll-a with $R^2$ more than 0.9. The deepest the water, the much lesser the value of $R_{rs}$. This is because of the rate of the sunlight penetration into the ocean water decreased with the increasing of the ocean depth. Thus, the total amount of sunlight that will be reflected back by the ocean particle and the water itself will be much lesser.

## ABSTRAK

Fokus kajian yang dijalankan adalah bertumpu di kawasan air keruh di pesisiran pantai.Komponen AOP telah ditentukan daripada sampel kajian yang telah diambil sepanjang kawasan persisiran pantai Kuala Terengganu. Perhubungan antara $R_{rs}$ dan $K_d$ dengan kepekatan klorofil-a telah berjaya dikaji. Panjang gelombang yang paling sesuai untuk menentukan dan mengesan kepekatan klorofil-a ialah pada panjang gelombang 509nm dan 532nm. Selain itu, nilai $R^2$ yang tinggi iaitu 0.649 menunjukkan terdapat korelasi di antara $R_{rs}$ dan kepekatan klorofil-a pada panjang gelombang 509nm jika dibandingkan dengan panjang gelombang yang lain. Sementara itu, untuk komponen yang lain iaitu $K_d$, spektrum cahaya nampak iaitu pada panjang gelombang 443, 490, 510, 532, 555 dan 647nm telah menunjukkan korelasi antara nilai $K_d$ dengan kepekatan klorofil-a dengan nilai $R^2$ melebihi 0.9. Semakin tinggi nilai kedalaman air, maka semakin rendah nilai $R_{rs}$. Ini disebabkan oleh kadar kemasukan dan penembusan cahaya matahari ke dalam air akan semakin berkurangan dengan kedalaman air. Oleh itu, jumlah amaun cahaya matahari yang akan dipantul balik oleh partikel dalam air seperti klorofil-a serta air itu sendiri akan turut berkurangan.