

THE IMPACT OF AIRPOLLUTIONAL PROPERTIES OF
MILKPOWDER ON THE PHYSICAL AND CHEMICAL PROPERTIES OF COASTAL WATERS

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

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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
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2007



**JABATAN SAINS SAMUDERA
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**RESEARCH PROJECT REPORT APPROVAL AND VALIDATION
 FORM I AND II**

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**THE ASSESSMENT OF APPARENT OPTICAL PROPERTIES OF
 CHLOROPHYLL-A IN KUALA TERENGGANU COASTAL WATER** by **NOOR
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 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
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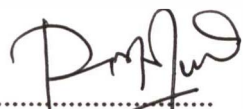


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DEDICATION:

THIS THESIS IS DEDICATED TO MY PARENTS, BROTHER AND SISTERS
AND ALSO TO MY DEAREST. THANK YOU FOR ALL OF YOUR SUPPORTS
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LIST OF ABBREVIATIONS:	PAGE
L_w = water leaving reflectance	9
$E_d(0^+, \lambda)$ = incident irradiance on surface	9
$E_d(0^-, \lambda)$ = is the down welling irradiance just below the surface	10
$L_u(0^+, \lambda)$ = upwelling radiance just above the surface	10
$L_u(0^-, \lambda)$ = upwelling radiance just below the surface	10
ρ = Fresnel reflectance index of seawater (0.021)	10
η_w = Fresnel refractive index of seawater (1.345)	10
α = Fresnel reflection albedo of sun and sky (1.345)	10

ABSTRACT

This study was concentrated on turbid and semi turbid multicomponential 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.