

**A STUDY OF EUPHOTIC DEPTH AT SOUTH CHINA SEA  
USING SATELLITE IMAGERY**

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**A STUDY OF EUPHOTIC DEPTH AT SOUTH CHINA SEA USING  
SATELLITE IMAGERY**

**By**

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The requirements for the degree of  
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DEPARTMENT OF MARINE SCIENCE  
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**DECLARATION AND VERIFICATION REPORT**

**RESEARCH PROJECT I AND II**

It is hereby declared and verified that this research report entitled:  
A STUDY OF EUPHOTIC DEPTH AT SOUTH CHINA SEA USING SATELLITE  
IMAGERY by NUR ZURAIRAH BINTI ZAKARIA, Matric No. UK14728 have  
been examined and all errors identified have been corrected. This report is submitted  
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## LIST OF ABBREVIATIONS

AVHRR	-	Advance Very High Resolution Radiometer
CDOM	-	colored dissolved organic matter
CZCS	-	<i>Coastal Zone Color Scanner</i>
°C	-	degree celcius
EOS	-	Earth Observing System
m	-	meter
MgCO <sub>3</sub>	-	magnesium carbonate
ml	-	milimeter
MODIS	-	Moderate Resolution Imaging Spectroradiometer
μm	-	micrometer
nm	-	nanometer
SCS	-	South China Sea
PAR	-	<i>photosynthetically active radiation</i>
SeaWiFS	-	Sea-viewing Wide Field-of-view Sensor

## ABSTRACT

Euphotic depth is called critical depth in which the photosynthesis and respiration are balance with each other. Therefore, the retrieval of the euphotic depth is important on estimating ocean primary productivity and it plays an important role in global carbon cycle. The concentration of chlorophyll-a is one of the most important since it is used to estimate the primary productivity of water ecosystems. This study was conducted along Kuala Terengganu coastal waters in May 2009 and July 2009 which covers 32 stations. Secchi disc and light meter were used to measure water transparency while water samples were collected to analyze the concentration of chlorophyll-a. Euphotic depth was calculated from the secchi disc and light meter data. Maps of euphotic depth for South China Sea were produced from the satellite data. The regression analysis between satellite data and light meter confirmed that light meter give better accuracy to measure euphotic depth compared to secchi disc as the light meter can measure  $K_d$  with high accuracy. Euphotic depth is lower near coastal area and increase gradually towards the open sea.

# KAJIAN KEDALAMAN EUFOTIK DI LAUT CHINA SELATAN MENGUNAKAN DATA SATELIT

## ABSTRAK

Kedalaman eufotik dikenali sebagai kedalaman kritikal di mana fotosintesis dan respirasi adalah seimbang antara satu sama lain. Oleh sebab itu, kajian mengenai kedalaman eufotik penting untuk menganggarkan produktiviti primer dan ia memainkan peranan penting dalam kitar karbon. Kepekatan klorofil-a merupakan salah satu elemen penting yang digunakan untuk menganggarkan produktiviti primer di dalam ekosistem air. Kajian ini telah dijalankan di sepanjang perairan Kuala Terengganu pada bulan Mei 2009 dan Julai 2009. Piring secchi dan meter cahaya telah digunakan untuk mengukur ketelusan air manakala sampel air diambil untuk analisis klorofil-a. Peta kedalaman eufotik bagi Laut China Selatan dihasilkan daripada data satelit. Analisis regresi antara data satelit dan meter cahaya membuktikan meter cahaya memberikan ketepatan yang lebih untuk mengukur kedalaman eufotik berbanding piring secchi memandangkan meter cahaya boleh mengukur  $K_d$  dengan ketepatan yang tinggi. Kedalaman eufotik adalah lebih rendah dikawasan pesisir dan meningkat secara beransur-ansur kea rah laut lepas.