A COMPARISON OF CHLOROPHYLL-a MEASUREMENTS FROM MODIS AND SEAWIFS IN TERENGGANU WATERS

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FACULTY OF MARITIME STUDIES AND MARINE SCIENCE UNIVERSITY MALAYSIA TERENGGANU
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A comparison of chlorophyll-a measurements from modis and seawifs in Terengganu waters / Tan Beng Poh.

Lihat Sebelah

A COMPARISON OF CHLOROPHYLL-a MEASUREMENTS FROM MODIS AND SEAWIFS IN TERENGGANU 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
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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 comparison of chlorophyll-a measurements from MODIS and SeaWiFS in Terengganu waters by Tan Beng Poh, Matric No. UK 14767 has been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor Science (Marine Science), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

m - meter

mg - milligram

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ABSTRACT

The amount of chlorophyll-a depends on the amount of algae and used as an indicator of phytoplankton abundance and biomass in coastal water. The concentration of chlorophyll-a also could be a general measure of water quality. A series of Moderate Resolution Imaging Spectroradiometer (MODIS) and Sea-viewing Wide Field-of-view Sensor (SeaWiFS) data were used in this study to investigate the amount of chlorophyll-a along Terengganu waters. The objectives of this study are to determine the chlorophyll-a concentration from satellite imageries and *in-situ* measurement and to compare the chlorophyll-a concentration from MODIS and SeaWiFS. The sampling period were in 13-16 May 2009 and 6-9 July 2009, starting from Redang Island to Kapas Island. The *in-situ* concentration of chlorophyll-a for the first sampling ranging from 0.25 to 3.31 mg/m^3. While the second sampling ranging from 0.13 to 1.21 mg/m^3. There was a good agreement between *in-situ* and MODIS chlorophyll-a concentration with $R^2 = 0.898$. Correlation between MODIS and SeaWiFS data over 2009 however varies from $R^2 = 0.018$ to 0.900. This happens maybe due the presence of cloud and haze in MODIS and SeaWiFS image. This study revealed that more satellite images available for MODIS compared to SeaWiFS. This may be due to SeaWiFS satellite server problem. In a nutshell, MODIS is more likely to used for determining the concentration of chlorophyll-a compared to SeaWiFS.

PERBANDINGAN PENGUKURAN KLOROFIL-a DARI MODIS DAN SEAWIFS DI PERAIRAN TERENGGANU

ABSTRAK

Kuantiti klorofil-a bergantung kepada kuantiti alga dan digunakan sebagai penunjuk kelimpahan serta biojisim fitoplankton di kawasan pantai. Konsentrasi klorofil-a juga digunakan sebagai pengukur am kualiti air. Satu rentetan data Moderate Resolution Imaging Spectroradiometre (MODIS) dan Sea-viewing Wide Field-of-view Sensor (SeaWiFS) digunakan dalam penyelidikan ini untuk mengkaji kuantiti klorofil-a sepanjang perairan Terengganu. Objektif kajian ini adalah untuk menentukan konsentrasi klorofil-a dari imej satelit dan bacaan kawasan kajian serta membandingkan konsentrasi klorofil-a dari MODIS dan SeaWiFS. Tempoh penyampelan iaitu 13-16 May 2009 dan 6-9 Julai 2009, bermula dari Pulau Redang ke Pulau Kapas. Bacaan konsentrasi klorofil-a di kawasan kajian pada penyampelan kali pertama adalah antara 0.25 hingga 3.31 mg/m^3. Manakala bagi penyampelan kali kedua, bacaan adalah antara 0.13 hingga 1.21 mg/m^3. Hubungan antara nilai klorofil-a bagi data dari kawasan kajian dengan data MODIS adalah bagus, iaitu $R^2 = 0.898$. Kolerasi antara data MODIS dan SeaWiFS adalah di dalam lingkungan 0.018-0.900. Ini berlaku mungkin disebabkan kehadiran awan dan jerebu di imej MODIS dan SeaWiFS. Kajian ini mengesahkan bahawa MODIS mempunyai lebih banyak imej satelit berbanding dengan SeaWiFS. Ini mungkin disebabkan masalah pelayaran satelit SeaWiFS. Keseluruhannya, MODIS lebih bagus digunakan dalam menentukan konsentrasi klorofil-a berbanding dengan SeaWiFS.