

A STUDY OF TOTAL SUSPENDED SOLID (TSS) FROM SATELLITE
IMAGERY AND GROUND TRUTH DATA AT MERANG AND
ROMPIN COASTAL AREA

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**A STUDY OF TOTAL SUSPENDED SOLID (TSS) FROM SATELLITE IMAGERY AND
GROUND TRUTH DATA AT MERANG AND ROMPIN COASTAL AREA**

By

Mohd Adi Syahmeer bin Bani Yamin

Research Report submitted in partial fulfillment

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**DEPARTMENT OF MARINE SCIENCE
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UNIVERSITI MALAYSIA TERENGGANU**

**DECLARATION AND VERIFICATION FORM
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:

A Study of Total Suspended Solid (TSS) from Satellite Imagery and Ground Truth Data at Merang and Rompin Coastal Area by Mohd Adi Syahmeer bin Bani Yamin, Matric No. UK 21605 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 of Science (Marine Science)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATION

ABBREVIATIONS

m	metre
mg/L	milligram per litre
km	kilometers
TSS	total suspended solid
nm	nanometer
MODIS	Moderate Resolution Imaging Spectroradiometer
km ²	kilometers square
GFC	glass fiber cellulose
°C	degree Celsius
mL	milliliter
envi	ENvironment for Visualizing Images

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ABSTRACT

Total Suspended Solid (TSS) is the solid materials either organic or inorganic which are suspended in water column. TSS can be one of the main factors of water quality at water body. A study was done around Merang coastal area on 20th June 2011 to 22nd June 2011 and Rompin coastal area on 30th June 2011 to 1st July 2011 and 21st October 2011. The objectives of this study are to find the concentration of TSS at Merang and Rompin coastal area and to determine the correlation between satellite image data and ground truthing data of Total Suspended Solid in Rompin and Merang coastal area. 17 sampling station were sampled for each location make it 35 station were sampled. The range of TSS at Merang coastal area is between 0.7 mg/L to 12.3 mg/L. The highest concentration for TSS at Merang is station 9 with 12.3 mg/L. For Rompin coastal area, the range of TSS is between 0.7 mg/L to 13.1 mg/L. The highest concentration at Rompin is at station 13 which is at 13.1 mg/L. From the MODIS data, the highest concentration of TSS at Merang coastal area is at station 1 with 1.03 mg/L, while for Rompin coastal area is at station 11 with the value 1.13 mg/L. The regression analysis shows that the R^2 between ground truths with imagery data is 0.143 and the root mean square error (RMSE) is 1.931. The study shows that the TSS was not accurately estimated and this might be cause by the less number on sampling stations, lack of optical data on the sampling location, the other region of algorithm used, and also lack of imagery data at the sampling period. The objective for this study was achieved. For further study, more field data is required, the usage of cloud free image, the development of own algorithm for South China Sea is required, The other necessary parameter for optical data need to be taken in order to built own region of algorithm.

**KAJIAN JUMLAH PEPEJAL TERAMPAI DARIPADA PENGIMEJAN
SETELIT DAN PENILAIAN LAPANGAN DI KAWASAN PESISIR PANTAI
MERANG DAN ROMPIN.**

ABSTRAK

Jumlah pepejal terampai adalah bahan pepejal sama ada organik atau bukan organik yang terampai di dalam air. Jumlah pepejal terampai boleh menjadi salah satu faktor utama kualiti air pada sesuatu kawasan. Kajian ini telah dilakukan di sekitar Merang pesisir pantai pada 20 Jun 2011 hingga 22 Jun 2011 dan Rompin pesisir pantai pada 30 Jun 2011 hingga 1 Julai 2011 dan 21 Oktober 2011. Objektif kajian ini adalah untuk mencari kepekatan jumlah pepejal terampai di kawasan pesisir pantai Merang dan Rompin dan untuk menentukan korelasi antara data imej satelit dan data penilaian lapangan. 17 stesen persampelan telah disampel bagi kedua-dua lokasi menjadikan 35 stesen telah disampel. Lingkungan kepekatan jumlah pepejal terampai di pesisir pantai Merang adalah di antara 0.7 mg/L ke 12.3 mg/L. Kepekatan tertinggi di Merang adalah pada stesen 9 dengan 12.3 mg/L. Bagi pesisir pantai Rompin, lingkungan kepekatan jumlah pepejal terampai ialah antara 0.7 mg/L ke 13.1 mg/L. Kepekatan tertinggi di Rompin adalah di stesen 13 iaitu pada 13.1 mg/L. Daripada data MODIS, kepekatan tertinggi jumlah pepejal terampai di pesisir pantai Merang adalah di stesen 1 dengan 1.03 mg/L, manakala bagi pesisir pantai Rompin adalah pada stesen 11 dengan nilai 1.13 mg/L. Analisis regresi menunjukkan bahawa R^2 data penilain lapangan dengan data imej satelit adalah 0.143 dan ralat punca purata kuasa dua adalah 1.931. Kajian menunjukkan bahawa jumlah pepejal terampai tidak tepat dan ini mungkin disebabkan oleh bilangan stesen persampelan yang kurang,

kekurangan data optik di lokasi pensampelan, penggunaan algoritma kawasan lain di kawasan persampelan, dan juga kekurangan data imej pada tempoh persampelan. Objektif bagi kajian ini telah tercapai. Untuk kajian lanjutan, data yang lebih diperlukan, penggunaan imej tanpa awan, penghasilan algoritma tersendiri untuk Laut China Selatan, dan parameter data optic yang lebih untuk menghasilkan algoritma kawasan tersendiri.