

A STUDY OF SEA SURFACE TEMPERATURE (SST) CHANGES IN
MERANG AND ROMPIN COASTAL AREA FROM IN-SITU DATA
AND SATELLITE IMAGERY

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**A STUDY OF SEA SURFACE TEMPERATURE (SST) CHANGES IN MERANG AND
ROMPIN COASTAL AREA FROM IN-SITU DATA AND SATELLITE IMAGERY**

By

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Research Report submitted in partial fulfillment

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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION FORM
FINAL YEAR RESEARCH PROJECT**

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

A Study of Sea Surface Temperature (SST) Changes in Merang and Rompin Coastal Area From In-situ data and Satellite Imagery by Muhammad Zuhairi Bin Zakara, Matric No. UK 19086 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 ABBREVIATIONS

CO ₂	Carbon dioxide
GIS	Geographical Information System
GPS	Global Positioning System
H ₂ O	Water
HAB	Harmful Algal Blooms
Km ²	Kilometer square
LWIR	Long-wave Infrared
MODIS	Moderate-resolution Imaging Spectroradiometer
NASA	National Aeronautics and Space Administration
NO ₂	Nitrogen dioxide
NOAA	National Oceanographic and Atmospheric Administration
PFZ	Potential Fishing Zone
R ²	R-square
RMS	Root-Mean-Square
SWIR	Short-wave Infrared
SST	Sea Surface Temperature
SMMR	Scanning Multichannel Microwave Radiometer
μm	Micrometer
°C	Degree Celsius
%	Percent

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ABSTRACT

The study of sea surface temperature (SST) has been done widely across the globe and close-related to different events of natural phenomena in our atmosphere. It is also applicable in understanding the relation between SST and the recent issue of climate change. This study focuses on the SST determination of Merang and Rompin coastal area. At the same time, the objective is to determine the relationship between *in-situ* and satellite-derived SST data. By using the application of Moderate Resolution Imaging Spectroradiometer (MODIS), the data were obtained in the form of 3-day, 8-day composite data and annual SST data. The *in-situ* sampling was completed on 20th to 22nd June 2011 at Merang coastal area and 30th June to 1st July 2011 at Rompin coastal area, followed by second sampling on 20th to 22nd October 2011 for Rompin coastal area. The average of SST at Merang and Rompin coastal area were 29.53°C and 29.85°C respectively. From the results and projection of obtained data, the value of R^2 for both Merang and Rompin coastal area were 0.104 and 0.436; while the value of RMS error were 1.2379 and 0.6353 respectively. By the end of this study, the pattern of previous 5 years SST were observed and related to the previous occurred phenomena. It is observable that the inclining of SST due contributes to certain events such as El-Nino. Further study is crucial in having a better understanding of the relationship between SST and the ocean phenomenal occurrences.

KAJIAN SUHU PERMUKAAN AIR LAUT DI PERAIRAN MERANG DAN ROMPIN DARIPADA DATA IN-SITU DAN PENGIMEJAN SATELIT

ABSTRAK

Kajian mengenai suhu permukaan telah dilakukan secara meluas di seluruh dunia dan berkait rapat terhadap pelbagai kejadian fenomena semulajadi yang berlaku dalam atmosfera kita. Hal ini turut digunakan dalam memahami perkaitan di antara suhu permukaan air laut dan isu terbaru mengenai perubahan iklim. Kajian ini memfokuskan penentuan suhu permukaan air laut di kawasan perairan Merang dan Rompin. Pada masa yang sama, objektif adalah bertujuan untuk menentukan perkaitan di antara data *in-situ* dan imej satelit. Dengan menggunakan aplikasi MODIS, data diperolehi daripada komposit 3 hari, 8 hari dan tahunan. Penyampelan dilakukan pada 20 hingga 22 Jun 2001 di perairan Merang dan 30 Jun hingga 1 Julai 2011 di perairan Rompin, disertai dengan penyampelan kedua pada 20 hingga 22 Oktober 2011 di perairan Rompin. Purata suhu permukaan laut di perairan Merang dan Rompin masing-masing adalah 29.53°C dan 29.85°C. daripada keputusan dan pembentangan data, nilai R^2 bagi perairan Merang dan Rompin masing-masing adalah 0.104 dan 0.436, manakala nilai ralat RMS adalah 1.2379 dan 0.6353. pada penghujung kajian ini, corak perubahan suhu permukaan air laut bagi 5 tahun lalu telah diperhatikan dan berkait dengan fenomena yang telah berlaku. Ianya jelas bahawa peningkatan suhu permukaan air laut menyumbang kepada beberapa kejadian seperti El-Nino. Kajian seterusnya adalah penting bagi memperoleh lebih kefahaman mengenai perkaitan di antara suhu permukaan air laut dan kejadian fenomena semulajadi.