UTILIZATION OF NOAA DATA FOR SOUTHWEST MONSOON CLOUD DETECTION

MUHAMMAD SYAHIRUDDIN BIN SHAMSUDIN

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITI KOLLEJ SAINS DAN TEKNOLOGI MALAYSIA
KUSZA

UTILIZATION OF NOAA DATA FOR SOUTH WEST MONSOON CLOUD DETECTION

MUHAMMAD SHAHIFFUDEN BIN SHAMSUDIN

FACULTY OF SCIENCE AND TECHNOLOGY

UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY

MALAYSIA

2005

UTILIZATION OF NOAA DATA FOR SOUTH WEST MONSOON CLOUD DETECTION

BY

MUHAMMAD SHAHIFFUDEN BIN SHAMSUDIN

Research report submitted in partial fulfillment of the requirements for the degree of Bachelor of Science (Marine Science)

FACULTY OF SCIENCE AND TECHNOLOGY

UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY

MALAYSIA

2005

JABATAN SAINS SAMUDERA
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:
Utilization of NOAA Data for Southwest Monsoon Cloud Detection
oleh Muhammad Shahiffuden bin Shamsudin, No. Matrik UK 6716
telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda (Sains Samudera),
Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

.....
Penyelia Utama
Nama: Dr. Maged Mahmoud Marghany
Cop Rasmi: DR. MAGED MOHMOUD MARGHANY
Penyarah
Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang Telipot
Kuala Terengganu

Tarikh: 9/4/05

.....
Penyelia Kedua (jika ada)
Nama:
Cop Rasmi:

Tarikh: .....

.....
Ketua Jabatan Sains Samudera
Nama: Dr. Ahmad Shamsuddin B. Ahmad
Cop Rasmi: DR. AHMAD SHAMSUDDIN B. AHMAD
Ketua
Jabatan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu

Tarikh: 9/4/05

ACKNOWLEDGEMENTS

This primer is dedicated to my supervisor at University College of Science and Technology Malaysia (KUSTEM), Dr. Maged Mahmoud Maghany (now deceased) who hired me at a critical time in final year project as partial fulfillment of the requirements for the Degree of Bachelor of Marine Science and thus brought me into the field of remote sensing. Trained and practicing as a meteorologist, Dr. Maged took a lead role in the weather forecasting by using NOAA data and he was one of the finest lecturer and supervisor I've ever served under. I am especially grateful for his tolerance of my demands for more field work - our arguments were vociferous but always controlled by a mutual relationship.

I also would like to express my thanks and deepest appreciation to Encik Ku Kassim Ku Yaacob, Encik Mohammad Nasir bin Mohammad Kasni, Encik Mohammad bin Ibrahim and others workers in SEAFDEC for their helps and guidance in my project work.

Lastly I'm very grateful to my beloved parents Shamsudin bin Nurdin and Safinah binti Yusof and all my friends for their helps and support especially Siti Rahana binti Mamat, Mohd Asyraf bin Mohd Rejab, Mohd Faiz bin Samanudi, Nor Haslina Safina and Nor Amiera for their support and advice during this project.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

NOAA	–	National Oceanic and Atmospheric Administration
AVHRR	–	Advanced Very High Resolution Radiometer
TIROS	–	Television and Infrared Observation Satellite
POES	–	Polar Orbiting Environmental Satellite
HRPT	–	High Resolution Picture Transmission
LAC	–	Local Area Coverage
GAC	–	Global Area Coverage
APT	–	Automatic Picture Transmission
ISCCP	–	International Satellite Cloud Climatology Project
ESSA	–	Environmental Science Services Administration
SEAFDEC	–	South East Asian Fishery Development Centre
NE	–	Northeast Monsoon
SW	–	Southwest Monsoon
h	–	Hour
m	–	Metre
a.m	–	ante meridian
p.m	–	post meridian

LIST OF APPENDICES

ABSTRAK

Malaysia merupakan sebuah negara maritime yang terletak 7 darjah ke utara khatulistiwa di kawasan Asia Tenggara. Cuaca di Malaysia adalah panas dan lembap sepanjang tahun. Dewasa ini, awan memainkan peranan yang penting dalam cuaca sejagat. Hasil daripada kepentingan ini kelajuan dan pergerakan awan adalah penting dalam amaran cuaca. Tujuan projek ini adalah untuk mengkaji tentang bentuk geomorfologi dan pergerakkan awan semasa monsun barat daya di kawasan semenanjung Malaysia. Kelajuan dan pergerakkan awan dikaji dengan menggunakan gambar satellite NOAA (National Oceanic and atmospheric administration). Berdasarkan kajian yang dijalankan, halaju awan adalah berbeza bagi kedua-dua bulan pada monsun barat daya. Awan bergerak dengan kelajuan yang lebih tinggi pada 15 dan 16 Mei 2001 jika dibandingkan dengan kelajuan awan pada 27 dan 28 Ogos 2001. Kajian juga menunjukkan kehadiran awan cumulonimbus yang bergerak berhampiran dengan daratan melintasi kawasan pantai di pantai barat semenanjung Malaysia pada penghujung musim monsun barat daya. Apabila ketidakstabilan awan mencecah pada ketinggian tertentu, awan akan membawa hujan yang lebat beserta kilat di kawasan yang terlibat.

ABSTRACT

Malaysia is a maritime country and situated 7 degrees north of the equator in Southeast Asia. The weather in Malaysia is generally hot, sunny and humid throughout the year. Today clouds play important roles in the world climate. As a result, clouds movement and velocity were considered as an important part in weather forecasting. This project aims to investigate the cloud movements and velocity during Southwest monsoon period in Malaysia. The cloud movements and velocity were determined by using the NOAA (National Oceanic and Atmospheric Administration) satellite AVHRR images. Based on the study, the cloud speed was significant difference for this two month in Southwest monsoon seasons. The cloud speed is higher on 15 and 16 May 2001 compare with the cloud speed on 27 and 28 August 2001. From the study shows that the cumulonimbus clouds very often move inland across the coastal areas of the west coast of Peninsular Malaysia during the later part of the Southwest Monsoon. When the instability of the atmosphere reaches greater heights these clouds bring heavy rains and thunderstorms to the affected areas.