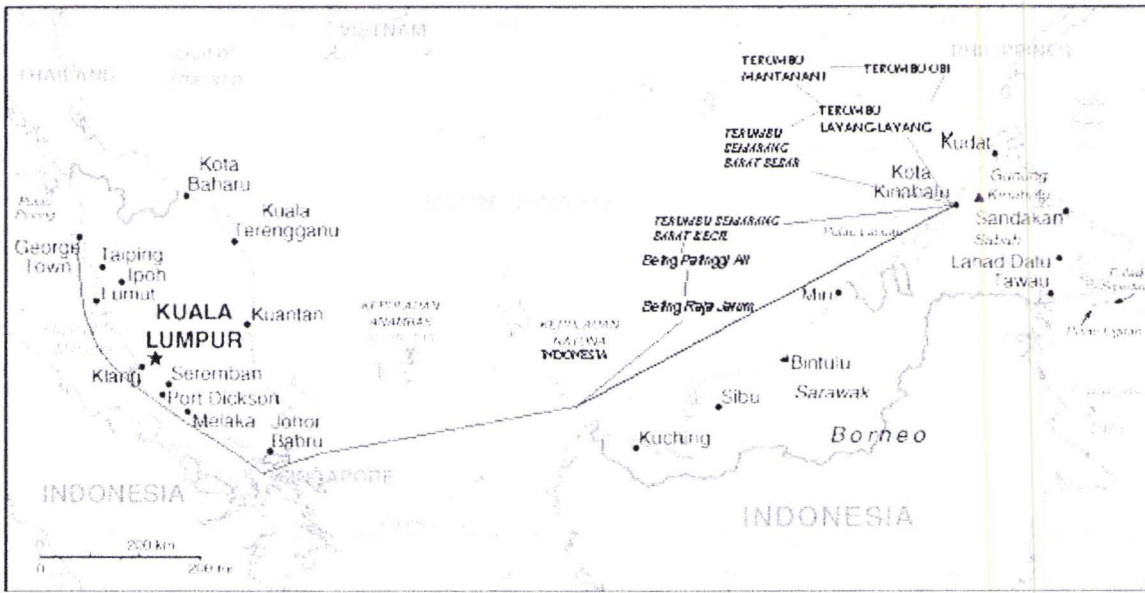


**FINAL REPORT  
OF  
SHORT TERM GRANT**



**“THE ROYAL SCIENTIFIC EXPEDITION TO THE  
SOUTH**

**CHINA SEA: INVESTIGATION AND PLANNING”**

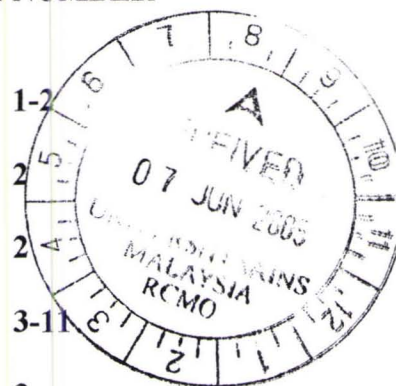
**BY**

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**SCHOOL OF BIOLOGICAL SCIENCES  
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UNIVERSITI SAINS MALAYSIA**

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## **INTRODUCTION**

The Royal Scientific Expedition to The South China Sea is one of the series of expedition to the South China Sea. The mission of this programme is to discover and scientifically inventorying the living marine resources of Malaysia's marine environment for the benefit of the nation.

The importance of maintaining the biological diversity is well known so is the acknowledgement by international communities that Malaysia is sitting in the centre of an area known as a hot spot. An area identified as the richest marine biological realm in the world. What is not known is the extent of this richness.

To take advantage of these factors, Malaysia's neighbours are quick to react to the new found wealth. Singapore has started an intensive research programme to evaluate this asset for the purpose of wealth creation – inventorying and patenting products that are of value from the South China Seas and its surrounding waters. The centre of this research is National University of Singapore.

Thailand in 2002 has started a Ministry to look at its biological resources within a large part of its activities based on the marine environment. Centres to do this are in Phuket and Bangkok. The Phuket Marine Biological Centre maintains international collaboration with Denmark for this purpose.

Malaysia is aware of its richness and importance in the marine realm. This is encapsulated in the Policy Statement of Malaysia's National Policy on Biological Diversity, "To conserve Malaysia's biological diversity and to ensure that its components are utilized in a sustainable manner for the continued progress and socio-economic

development of the nation” (Ministry of Science, Technology and The Environment, 1998).

However, exercises to secure this wealth is slow and lacks of focus. This where we propose a holistic and comprehensive approach to this problem through the Royal Scientific Expedition To The South China Sea (ROSES).

## **OBJECTIVE**

The objective of this project was to employ a research officer to investigate the past research or scientific information available with regards to scientific expedition to South China Sea or other expedition in the region. The research officer will also have to look into the scientific facilities required for a research vessel and to work together with the voyage leader to plan this expedition.

## **CHANGING EXPEDITION’S NAME**

Due to some unforeseen circumstances, the ROSES original name which was “Royal Scientific Expedition to The South China Sea” was changed to “Research On The Seas and Islands” before the expedition begin. However, the acronym “ROSES” remains.

## **METHODS, RESULTS AND DISCUSSIONS**

The implementation of this project were divided into two phase which are; I) Investigation and II) Planning.

### **I. Investigation**

The investigation was made by reviewing previous expeditions' reports in order to know the nature and research thrust on each expeditions. Some of the reports that were reviewed are from expeditions by SEAFDEC (South East Asian Fisheries Development Center) in 1998 and also Matahari Expedition Series (1985 – 1989). Details of those expeditions are shown in Table 1 below.

Those reports above are the expeditions which were made in Malaysian waters. A part of the expedition reports, books and reports regarding the marine organisms found in this region were also being reviewed to get a preliminary idea of the sampling techniques and the samples before the actual expedition occurs. However, most of the information obtain from this sources do not cover the actual area for this project. Most of the reports covers certain area in Malaysian waters. Thus, pieces of information had to be assembled from the various sources to get a clearer picture on the area that ROSES proposed to proceed. Based on the information from the literature, planning phase can be done.

Table 1: List of previous expeditions reviewed for ROSES project.

No.	EXPEDITION	YEAR	OBJECTIVES/RESEARCH	ORGANIZER	AREA	VESSEL
1	Ekspedisi Matahari 85	1985	1. Physical, chemical, geological and biological processes 2. Nature and distribution on living marine resources 3. Pollution 4. Training for students	Universiti Pertanian Malaysia (Later known as Universiti Putra Malaysia) UPM	Offshore waters of Malaysian Economic Exclusive Zone off the coast of Terengganu.	RV Kagoshima Maru (Japan)
2	Ekspedisi Matahari 86	1986	Same as above	Universiti Pertanian Malaysia	South of Ekspedisi Matahari 85's area. (South of Kuala Terengganu to north of Pulau Tioman)	RV Kagoshima Maru (Japan)
3	Ekspedisi Matahari 87	1987	Same as above	Universiti Pertanian Malaysia	112 to 172 nautical miles from the coast of Sarawak.	RV Kagoshima Maru (Japan)
4	Ekspedisi Matahari 89	1989	Same as above	Universiti Pertanian Malaysia	30 to 80 nautical miles from the coast of Sabah	RV Kagoshima Maru (Japan)
5	Marine Fishery Resources Survey in The South China Sea, Area 1: Gulf of Thailand and East Coast of Peninsular Malaysia	1997	1. Acoustic survey 2. Oceanographic survey 3. Fish sampling 4. Ocean productivity 5. Planktonic study	South East Asian Fisheries Development Center (SEAFDEC)	Gulf of Thailand and East Coast of Peninsular Malaysia	MV SEAFDEC
6	Marine Fishery Resources Survey in The South China Sea, Area 3: Western Phillipines	1998	1. Acoustic survey 2. Oceanographic survey 3. Fish sampling	South East Asian Fisheries Development Center (SEAFDEC)	Western Phillipines	MV SEAFDEC

## II) Planning

Knowing the nature and the research thrust of the expedition, planning the voyage is a crucial part which will determine the success of this expedition. The summary of the planning activities are shown below:

### A. Preparing the expedition route and sampling site.

The route for this expedition has been decided by Expedition Route Committee and it has been approved by Voyage Leader, National Security Division and Royal Malaysian Navy. The routes and sampling sites that were approved are shown in Table 2 and Table 3 below:

Table 2: Expedition route

Section	Venue
Section 1	Penang to Beting Raja Jarum, Beting Patinggi Ali, Terumbu Semarang Barat Kecil, back to Kota Kinabalu
Section 2	Kota Kinabalu to Terumbu Semarang Barat Besar, Terumbu Layang-layang, Terumbu Mantanani, Terumbu Ubi, back to Kota Kinabalu
Section 3	Kota Kinabalu to Penang

Table 3: Sampling location

No.	Location	Latitude	Longitude
1	Gugusan Raja Jarum ( <i>Stigent Reef, Richmond Reef, Herald Reef, Connell Reef</i> )	4 <sup>0</sup> 52'-5 <sup>0</sup> 8'N	112 <sup>0</sup> 24'-112 <sup>0</sup> 50'E
2	Gugusan Patinggi Ali ( <i>Hardie Reef, Aitken Reef, Buck Reef, Beian Reef, Tripp Reef, Moody Reef, Hayes Reef</i> )	5 <sup>0</sup> 22'-5 <sup>0</sup> 58'N	112 <sup>0</sup> 12'-112 <sup>0</sup> 35'E
3	Terumbu Semarang Barat Kecil	6 <sup>0</sup> 20'N	113 <sup>0</sup> 10'E
4	Terumbu Semarang Barat Besar	6 <sup>0</sup> 57'N	113 <sup>0</sup> 35'E
5	Terumbu Layang-Layang	7 <sup>0</sup> 24'N	113 <sup>0</sup> 48'E
6	Terumbu Ubi	7 <sup>0</sup> 37'N	113 <sup>0</sup> 57'E
7	Terumbu Mantanani	7 <sup>0</sup> 58'N	113 <sup>0</sup> 55'E
8	Terumbu Peninjau	8 <sup>0</sup> 8'N	114 <sup>0</sup> 34'E
9	Terumbu Siput	7 <sup>0</sup> 37'N	113 <sup>0</sup> 57'E
10	Terumbu Laya	7 <sup>0</sup> 36'N	113 <sup>0</sup> 46'E

The routes were chosen because it covers almost all the Malaysian Territorial waters. As for the sampling sites, all the sites were generally less exploited and visited by humans, thus it can be considered as virgin sites.

The map containing the expedition route of ROSES expedition are shown in Appendix 1a and 1b.

#### **B. Setting up the research areas.**

Few research areas have been set up to this voyage. The groups are:

- ◆ Reef mapping and description
- ◆ Hard corals
- ◆ Remote sensing
- ◆ Water quality
- ◆ Echinoderm (Sea cucumber, sea star, feather star, brittle star)
- ◆ Molluscs (Bivalve and gastropods)
- ◆ Giant clams conservation
- ◆ Soft corals and gorgonians
- ◆ Coral fishes
- ◆ Sea water nucleotides
- ◆ Benthic micro organisms
- ◆ Marine mammals
- ◆ Sea grasses

#### **C. Setting up the organizing committee for managing the expedition.**

Various committee was being set up by the Voyage Leader in order to help with the preparation of the expedition. Within this committee, few sub-committees were also set up to delegate the works. The list of committee and sub committee are shown in Table 4.

Table 4: List of organizing committee for ROSES expedition.

No.	Position/Committee	Name	Department/Institution
1	Patron	Prof. Ho Sinn Chye	National Oceanography Directorate (NOD)
		Prof. Mashor Mansor	
2	Voyage Leader	Prof. Zulfigar Yasin	USM
3	Deputy Voyage Leader	Mahadi Mohammad	
4	Secretary	Sazlina Md. Salleh	
5	Treasury/base manager	Dr. Aileen Tan Shau Hwai	
6	Technical	Rosly Basarudin	
		Mohd. Rozmi Hassan	
		Wan Asmadi Wan Ab.Llah	
		Anuar Mohd Nor	
		Rosli Abu Bakar	
7	Expedition track	Prof Zulfigar Yasin	
		Mahadi Mohamad	
		Izwandy Idris	
8	Medical	Dr. Harmi bin Mohd Yusof	USM (Health Campus)
		Dr. Akbar Ali	USM Health Centre
9	Safety and security	Balasubramanium a/l Kandasamy	USM
10	Scientific preparation	Sazlina Md. Salleh	
		Mahadi Mohamad	
		Izwandy Idris	
		Farizan Samad	
		Norliza Abu Hasan	
		Cheah Wee	
		Sim Yee Kwang	
		Wong Wai Sin	
11	Publicity	Cheah Wee	
		Sim Yee Kwang	
		Mohamad Abdullah	USM (Public Relations Office)

The list of meeting for organizing committee and other agencies related to ROSES project are shown in Appendix 2.

**D. Inviting scientists from other institutions to join the expedition.**

Other institutions were invited to be in this voyage due to their expertise in certain areas. The presence of other scientists from other institutions will make this expedition more successful based on their knowledge and experiences. The list of institutions and their area of expertise are given in Table 5 below:

Table 5: List of inviting institutions and their expertise.

No.	Institutions	Area of expertise
1	MACRES (Malaysian Centre for Remote Sensing)	Remote sensing
2	UPM (Universiti Putra Malaysia)	Coral fish
3	UKM (Universiti Kebangsaan Malaysia)	Seawater nucleotides and benthic micro organisms
4	UMS (Universiti Malaysia Sabah)	Marine mammals
5	MIMA (Maritime Institute of Malaysia)	Marine policy

The Universiti Sains Malaysia's researchers are also coming from various departments and schools as in Table 6 below:

Table 6: List of school and department from USM involving in ROSES project.

No.	School/Department in USM	Area of expertise
1	School of Biological Sciences (Marine and Coastal Studies)	Hard corals, reef mapping and description, soft corals and gorgonians, water quality, mollusc and gastropods, giant clams, sea cucumber, sea star, and sea grasses.
2	School of Humanities (Geography section)	Remote sensing
3	School of Physics	Remote sensing

Twenty four expeditioners are planned to be onboard during the expedition. Out of that figure, two personnel were Royal Malaysian Navy (RMN) officer who represents National Security Department (NSD) and one personnel represent from the consultant

company. All the expeditioners undergone medical check- up to make sure that they are fit for this voyage. The list of expeditioners is listed in Appendix 3.

**E. Securing the research vessel.**

The research vessel that will be used in this expedition must be fulfilling to certain criteria before it being used. In this process, three vessel inspections to were made by the selecting committee to look for a suitable research vessel. The inspections are listed in Table 7 below.

Table 7: List of vessel inspections.

No.	Vessel Inspections	Date	Port
1	MV Genesis	May 6 - 10, 2004	Mumbai, India
2	MV Prof. Bogorov	May 16-19, 2004	Otaru, Japan
3	MV Allied Commender	June 10, 2004	Port Klang, Malaysia.

All the proposed vessels undergo a tender process before it is being selected. The vessel that was chosen for this voyage is MV Allied Commander, an icebreaker research vessel. There are fourteen crew including a master onboard this vessel. The pictures of vessels are shown in Appendix 4.

**F. Obtaining weather forecast, tide tables and nautical charts for the expedition.**

The Meteorological Department of Malaysia had provided data of weather from previous years and also the forecast weather on expedition's area to facilitate the voyagers before and during the expeditions. This data is crucial to assist with the diving

and sampling activities during this expedition. In addition to that, nautical charts and tide tables were also being provided by RMN upon request.

**G. Obtaining Approval from National Security Division.**

Due to security reason, the approval from the National Security Division is essential. Prior to that, an official application was sent to the NSD containing all the specifications of this voyage including vessel's information, number of people onboard, duration, research activities and equipments onboard. Several meetings were also being conducted between NSD, Voyage Leader and RMN to discuss matters related to the expedition. Upon approval the NSD required that the expedition is accompanied by two Navy personnel to ensure the safety of the expedition.

**H. Trial runs and trainings for expeditioners.**

Four trial runs were done prior to the actual voyage. The objectives of the trial run were to test the scientific equipments, to sharpen the scientific and diving skills among the researchers and also to get a brief idea of the actual expedition. A part of that, a weekly practical session of scientific diving swimming and live saving were also conducted for all the voyagers to ensure the safety throughout the voyage. Table 8 list all the trainings conducted for the expeditioners while Table 9 list out all the trials including sea trials conducted for this voyage.

Table 8: List of trainings for ROSES expeditioners.

No.	Activities	Date	Venue
1	Scientific Diving Protocol Training	January 16, 2004	USM
2	Scientific Diving Protocol Training	January 30, 2004	USM

3	Scientific Diving Protocol Training	February 6, 2004	USM
4	Scientific Diving Protocol Training	February 13, 2004	USM
5	Scientific Diving Protocol Training	February 20, 2004	USM
6	Scientific Diving Protocol Training	February 27, 2004	USM
7	Scientific Diving Protocol Training	March 5, 2004	USM
8	Cardio Pulmonary Resuscitation (CPR) Course	February 13, 2004	USM Health Centre

Table 9: Trials for ROSES expedition.

No.	Activities	Date	Venue
1	1 <sup>st</sup> Sea Trial	January 29, 2004	Pulau Songsong, Kedah
2	Spectro Radiometer Test	February 9, 2004	ROSES Operation Centre, USM
3	Underwater Videography Trial	February 12, 2004	USM
4	Hydrolab Trials	February 16-18, 2004	MACRES, Kuala Lumpur
5	2 <sup>nd</sup> Sea Trial	April 5-7, 2004	Pulau Langkawi, Kedah

#### **I. Scientific workshop for expeditioners.**

One scientific workshop for researchers was conducted on 11<sup>th</sup> October 2003 to firm the research concentration among the researchers. This workshop is attended by all the expeditioners and also various agencies and universities related to this voyage. The agencies are Meteorological department, MACRES and MIMA while universities are Universiti Kebangsaan Malaysia, Universiti Malaysia Sabah and Universiti Putra Malaysia.

## **SUMMARY**

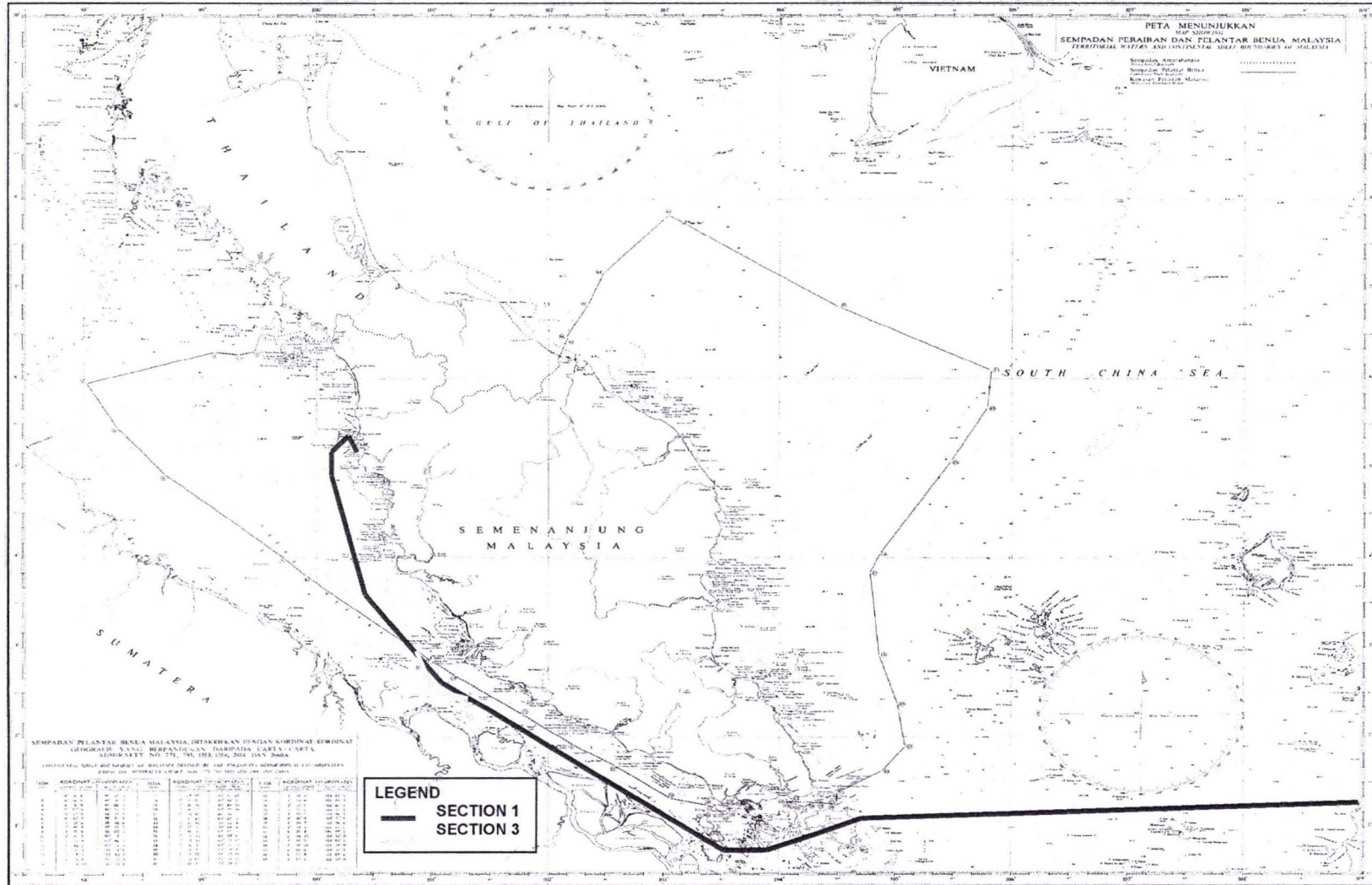
The success of The Royal Scientific Expedition to The South China Sea (later known as Research On The Seas and Islands) – ROSES reflected from this project. This project can be a template to the planning for the next series of ROSES expedition or other marine scientific expedition in the future.

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TIDAK SESUKU DIPER PANDUAN

# MALAYSIA

SYIT (SHELL) 1

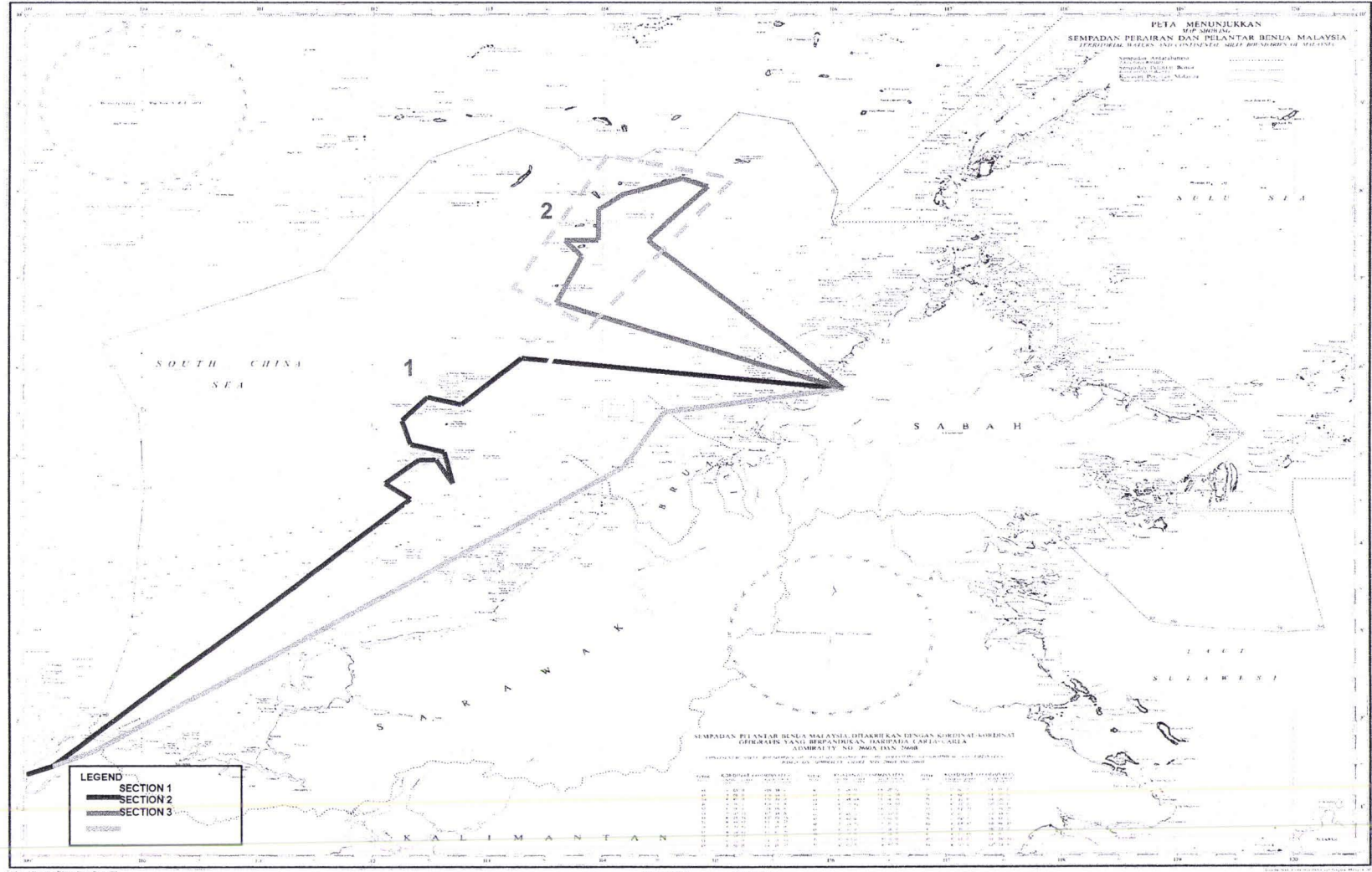


SEMPADAN PELANTAR BENUA MALAYSIA, DITAKHIRKAN DENGAN KOORDINAT KOORDINAT GEOMETRIK YANG BERSAMA-SAMA, DARIPADA GARIS CARTA SEMBANYUT NO. 770, 781, 782, 783, 784 DAN 785.

TERMINAL SUDUT DAN SEMPADAN PELANTAR BENUA MALAYSIA, DITAKHIRKAN DENGAN KOORDINAT KOORDINAT GEOMETRIK YANG BERSAMA-SAMA, DARIPADA GARIS CARTA SEMBANYUT NO. 770, 781, 782, 783, 784 DAN 785.

NO.	KOORDINAT TERMINAL SUDUT	KOORDINAT SEMPADAN PELANTAR BENUA	NO.	KOORDINAT TERMINAL SUDUT	KOORDINAT SEMPADAN PELANTAR BENUA
1	05° 30' 00" U	101° 00' 00" T	11	05° 30' 00" U	101° 00' 00" T
2	05° 30' 00" U	101° 00' 00" T	12	05° 30' 00" U	101° 00' 00" T
3	05° 30' 00" U	101° 00' 00" T	13	05° 30' 00" U	101° 00' 00" T
4	05° 30' 00" U	101° 00' 00" T	14	05° 30' 00" U	101° 00' 00" T
5	05° 30' 00" U	101° 00' 00" T	15	05° 30' 00" U	101° 00' 00" T
6	05° 30' 00" U	101° 00' 00" T	16	05° 30' 00" U	101° 00' 00" T
7	05° 30' 00" U	101° 00' 00" T	17	05° 30' 00" U	101° 00' 00" T
8	05° 30' 00" U	101° 00' 00" T	18	05° 30' 00" U	101° 00' 00" T
9	05° 30' 00" U	101° 00' 00" T	19	05° 30' 00" U	101° 00' 00" T
10	05° 30' 00" U	101° 00' 00" T	20	05° 30' 00" U	101° 00' 00" T

Appendix 1a: ROSES Route (West Malaysia)



**Appendix 1b: ROSES Route (East Malaysia)**

## Appendix 2 (List of Committee's Meetings)

No.	Activities	Date	Venue
1	1 <sup>st</sup> Organizing Committee Meeting	September 12, 2003	Conference Room, CEMACS, USM
2	2 <sup>nd</sup> Organizing Committee Meeting	September 23, 2003	Conference Room, CEMACS, USM
3	3 <sup>rd</sup> Organizing Committee Meeting	October 23, 2003	Conference Room, CEMACS, USM
4	4 <sup>th</sup> Organizing Committee Meeting	October 27, 2003	Conference Room, CEMACS, USM
5	5 <sup>th</sup> Organizing Committee Meeting	January 12, 2004	Conference Room, CEMACS, USM
6	6 <sup>th</sup> Organizing Committee Meeting	January 20, 2004	Conference Room, CEMACS, USM
7	7 <sup>th</sup> Organizing Committee Meeting	February 3, 2004	Conference Room, CEMACS, USM
8	8 <sup>th</sup> Organizing Committee Meeting	February 10, 2004	Conference Room, CEMACS, USM
9	9 <sup>th</sup> Organizing Committee Meeting	February 16, 2004	Conference Room, CEMACS, USM
10	10 <sup>th</sup> Organizing Committee Meeting	March 18, 2004	Conference Room, CEMACS, USM
11	11 <sup>th</sup> Organizing Committee Meeting	April 24, 2004	Conference Room, CEMACS, USM
12	12 <sup>th</sup> Organizing Committee Meeting	May 26, 2004	Conference Room, CEMACS, USM
13	13 <sup>th</sup> Organizing Committee Meeting	June 4, 2004	Conference Room, CEMACS, USM
14	1 <sup>st</sup> Logistic Meeting with NSD <sup>1</sup> and RMN <sup>2</sup>	February 12, 2004	Conference Room, School of Biological Sciences, USM
15	2 <sup>nd</sup> Logistic Meeting with NSD <sup>1</sup> and RMN <sup>2</sup>		NSD and RMN office
16	Scientific Committee Meeting	January 16, 2004	ROSES Operation Centre, USM
17	Publicity Committee Meeting	January 16, 2004	ROSES Operation Centre, USM
18	Remote Sensing Committee Meeting	January 21, 2004	Conference Room, CEMACS, USM
19	Tender Board Meeting		Jabatan Bendahari, USM

1. NSD: National Security Division (Bahagian Keselamatan Negara), Prime Minister's Department.
2. RMN: Royal Malaysian Navy

### Appendix 3 (List of Expeditioners)

#### Researchers

No.	Name	Institutions
1.	Aziz bin Arshad	Universiti Putra Malaysia
2.	Aileen Tan Shau Hwai	Universiti Sains Malaysia
3.	Che Abd. Rahim Mohamed	Universiti Kebangsaan Malaysia
4.	Cheah Wee	Universiti Sains Malaysia
5.	Farizan binti Samad	Universiti Sains Malaysia
6.	Izwandy bin Idris	Universiti Sains Malaysia
7.	Kee Alfian bin Abd. Aziz	Universiti Kebangsaan Malaysia
8.	Mahadi bin Mohammad	Universiti Sains Malaysia
9.	Norliza binti Abu Hassan	Universiti Sains Malaysia
10.	Saifullah Arifin Jaaman	Universiti Malaysia Sabah
11.	Sazlina binti Md. Salleh	Universiti Sains Malaysia
12.	Sim Yee Kwang	Universiti Sains Malaysia
13.	Wong Wai Sin	Universiti Sains Malaysia
14.	Yuhana Ubong Lah Anyi	Universiti Malaysia Sabah
15.	Zulfigar bin Yasin	Universiti Sains Malaysia

#### Medical doctors

No.	Name	Institutions
1.	Harmi bin Mohammed Yusof	Universiti Sains Malaysia (Health Campus)
2.	Imran bin Ahmad	Universiti Sains Malaysia (Health Campus)
3.	Nazri bin Mohd Daud	Universiti Sains Malaysia (Health Campus)

#### Technical staff

No.	Name	Institutions
1.	Balasubramaniam a/l Kandasamy	Universiti Sains Malaysia
2.	Mohd. Rozmi bin Hassan	Universiti Sains Malaysia
3.	Mohd. Zamri bin Othman	Universiti Sains Malaysia
4.	Rosly bin Basarudin	Universiti Sains Malaysia

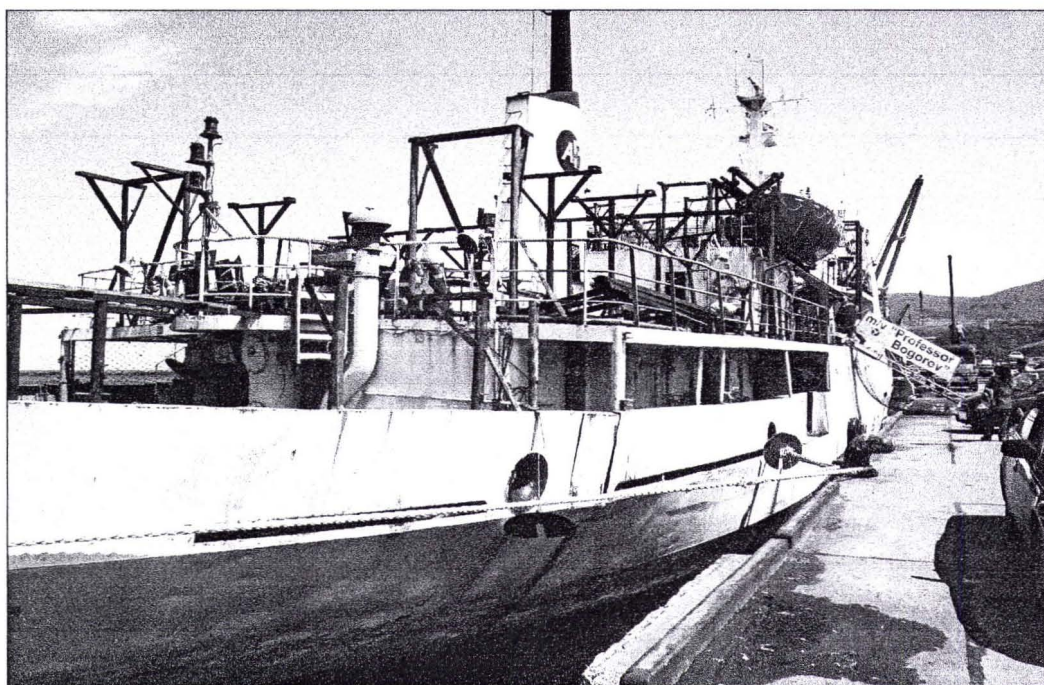
#### Consultant's representative

No.	Name	Institutions
1.	Rasol bin Puteh	Konsortium Logistik Berhad

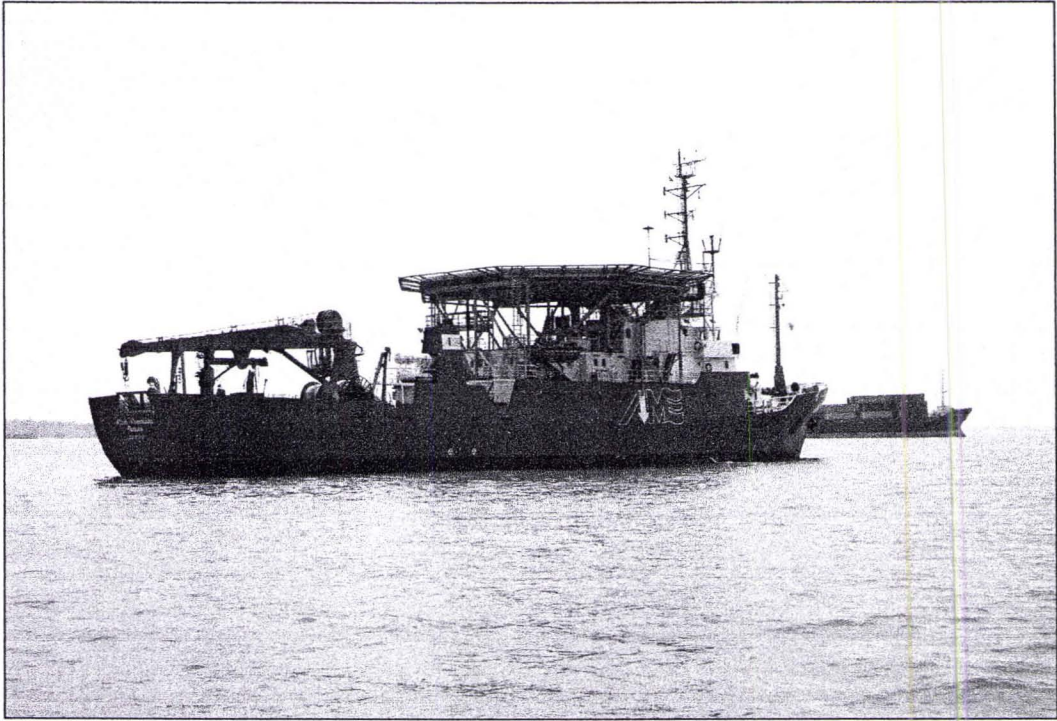
**Appendix 4 (Images of proposed vessels)**



**MV GENESIS**



**MV PROFESSOR BOGOROY**



**MV ALLIED COMMANDER**