

SEAFDEC Oceanographic Surveyed in the Southeast Asian Region

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Introduction

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous intergovernmental body established as a regional treaty organization in 1976 to promote fisheries development in Southeast Asia. The member countries of SEAFDEC at present are Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. SEAFDEC aims specifically to develop the fishery potential in the region through training, research and information services to improve the food supply by rational utilization of the fisheries resources in the region. SEAFDEC has the Secretariat as the administrative arm, and 4 technical departments namely: the Aquaculture Department (AQD), the Marine Fisheries Research Department (MFRD), the Marine Fishery Resources Development and Management Department (MFRDMD), and the Training Department (TD).

The Training Department is located in Samut Prakan, Thailand. The research activities of TD began in 1978 with studies on fishing gear technology, fishing grounds, fisheries socio-economics and spatial information. SEAFDEC/TD has been collecting and storing the oceanographic data from the surveys onboard two research vessels namely M.V. SEAFDEC and M.V. SEAFDEC 2. The surveys have been conducted in collaboration with other research institutes and member countries in the areas of physical oceanography, marine pollution, hydro-acoustic survey, fishery biology, food productivity, red tide, fish larvae, plankton and benthos. Research into fishing ground areas is carried out through numerous surveys on the studies of oceanographic parameters and hydrographic conditions of fishing grounds. The research data aims to support the research and training programs of the Department on fishing technology.

At the present, data and information management plays an important role in providing information for researchers in SEAFDEC member countries and others. With the concern on the benefits from using this supportive oceanographic data for users worldwide, SEAFDEC must expeditiously develops its data collection and information system to be more standard and user friendly. In this regard, there are needs of Human Resource Development Program for SEAFDEC Technical Staff through the participation in the international training, workshops and seminars which related to Information Management System.

SEAFDEC Oceanographic activities

M.V. SEAFDEC activities

In the past, the research activities of SEAFDEC focused mainly on fishing operations using M.V. SEAFDEC. In the year 1994, SEAFDEC initiated the collection of oceanography data such as physical, chemical and biological data through its research projects.

The surveyed area of M.V. SEAFDEC is covered all member countries waters including the Eastern Indian Ocean. The survey was conducted in annually basis around October to February. Since 1993, the SEAFDEC has been conducted tuna resource surveys in the Eastern Indian Ocean using M.V. SEAFDEC and started up fishing ground conditions surveys in this area in 1997. This research project aims to provide information on fishing ground conditions, distribution and biological aspects of tuna in the Eastern Indian Ocean. Fishing ground conditions, which composed of Temperature, Salinity, pH, Dissolve Oxygen, and Fluorescence were measured by using the ICTD (Integrated Conductivity Temperature and Depth) and XBT (Expandable Bathythermograph) instruments. From the collected data, temperature profiles by depth were analyzed in relative to catch.

M.V. SEAFDEC 2 activities

In June 2002, the Government of Japan approved the construction of a Fishery Research and Training Vessel capable of conducting fishery surveys and training operations in coastal waters of ASEAN countries. The construction of the new vessel, M.V. SEAFDEC 2, was completed in fall of 2003 and it was officially launched at Niigata, Japan on 6 December 2003.

Since the arrival of M.V. SEAFDEC 2 to SEAFDEC/TD, M.V. SEAFDEC2 has provided her service to assess the utilization of fishery resources in grant aid eligible countries and other SEAFDEC member countries by means of extensive scientific surveys of their coastal resources. In a broader sense, the acquisition of M.V. SEAFDEC 2 will help strengthen technical cooperation and effective fisheries and environmental management in the ASEAN region through the enhancement of research and training capability.

The M.V. SEAFDEC 2 activities focus on three specific areas, as following:

1. Fishing Research and Training
2. Oceanographic Surveys
3. On-Board Navigation and Engine Training

The oceanographic instruments

M.V. SEAFDEC

Instruments	Temperature	Salinity	Pressure	Dissolved Oxygen	Fluorescence	Conductivity	Depth
FSI CTD	✓	✓	✓	✓	✓	✓	✓
SBE CTD	✓	✓	✓	✓	✓	✓	✓
XBT	✓						✓

M.V. SEAFDEC 2

Instruments	Temperature	Salinity	Fluorescence	Dissolved Oxygen	pH	Conductivity	Irradiance	Pressure	Depth	Sediment	Zooplankton	Phytoplankton	Fish larvae
CTD systems (SeaBird SBE 911+)	✓	✓	✓	✓	✓	✓		✓	✓				
Thermosalinograph with Fluorometer (TSG-Fluorometer)	✓	✓	✓										
Bathythermograph Data Acquisition System (XBT&XCTD)	✓					✓			✓				
Profiling Reflectance Radiometer System (PRR)	✓						✓	✓	✓				
Temperature and Depth Recorder (TD)	✓								✓				
Piston core sampler										✓			
Smith-McIntyre Bottom Sampler										✓			
Bongo Paired Plankton Net System + Fish Larvae Net											✓		✓

Surveyed Area of M.V. SEAFDEC 2

The first fishing trial of M.V. SEAFDEC 2 was conducted during 19 April-15 May 2004 in the Andaman Sea. Oceanographic study was a part of activities during research surveys. After that cruise, SEAFDEC had conducted the collaborative research survey in the member countries waters. From 2004 to 2006, SEAFDEC had operated total 22 research cruises onboard M.V. SEAFDEC 2 as specify in table 1 and 2.

Table 1: Number of research cruises in each member country from 2004 to 2006

Country	2004	2005	2006
Brunei Darussalam	2 cruises	1 cruise	1 cruise
Cambodia	1 cruise	1 cruise	-
Indonesia	1 cruise	1 cruise	1 cruise
Malaysia	1 cruise	2 cruises	1 cruise
Myanmar	1 cruise	-	-
The Philippines	1 cruise	2 cruises	1 cruise
Thailand	2 cruises	2 cruises	1 cruise
Vietnam	1 cruise	1 cruise	1 cruise

Table 2: Information of each research cruises of M.V. SEAFDEC 2 from 2004 to 2006

Cruise No.	Leg	Area of Operation	Country	Period	Oceanographic instruments	Remark
1-1/2004		Andaman sea	Thailand	19 April – 15 May 2004	CTD, TSG, Bongo net, Grab, Core	- Test oceanographic equipment
2-2/2004		Andaman sea Malacca Strait	Myanmar Indonesia	19 – 20 May 2004 28 May 2004	CTD, TSG CTD, TSG	
3-3/2004	1 2 3 4 5	Malaysian waters Brunei Darussalam waters The Philippines waters From Philippines to Vietnam Vietnamese waters Cambodian waters	Malaysia Brunei Darussalam The Philippines PH-VN Vietnam Cambodia	30 June – 3 July 2004 6 – 8 July 2004 13 – 16 July 2004 17 – 19 July 2004 21 – 23 July 2004 28 – 31 July 2004	CTD, TSG CTD, TD, TSG CTD, TD, TSG XCTD, TSG CTD, TD, XCTD, TSG, Bongo net CTD, TSG, Bongo net, Grab	
4-4/2004		Gulf of Thailand	Thailand	17 – 29 August 2004	CTD, TD, TSG, PRR, Bongo net	
5-5/2004		Brunei Darussalam waters	Brunei Darussalam	11 September – 15 October 2004	CTD, TD, TSG, Bongo net, Larvae net	
6-6/2004		Gulf of Thailand	Thailand	3 – 6 November 2004	CTD, TSG, PRR, Bongo net	
7-1/2005		Gulf of Thailand	Thailand	1 – 13 February 2005	CTD, TSG, PRR, Bongo net	
8-2/2005	1 2	Brunei Darussalam waters The Western Philippines	Brunei Darussalam The Philippines	14 February – 11 March 2005 12 March – 7 April 2005	CTD, TD, TSG, Bongo net, Larvae net, Grab CTD, TD, TSG, Bongo net, Larvae net	
9-3/2005		Vietnamese waters	Vietnam	19 April – 18 May 2005	CTD, TD, TSG, PRR, Van Dorn water sampler	
10-4/2005		Sarawak Coast	Malaysia	25 May – 13 June 2005	CTD, TSG, Bongo net	
11-5/2005		Western Kalimantan	Indonesia	13 June – 2 July 2005	CTD, TSG, Bongo net	- Training for Human Resources Development on Marine Capture Fisheries in the BIMP-EAGA Region
12-6/2005		West Coast of Sabah	Malaysia	2 – 23 July 2005	CTD, TD, TSG, Bongo net	- Training for Human Resources Development on Marine Capture Fisheries in the BIMP-EAGA Region
13-7/2005		East Coast of Palawan Island	The Philippines	23 July – 16 August 2005	CTD, TD, TSG, Bongo net, Grab, Core	- Training for Human Resources Development on Marine Capture Fisheries in the BIMP-EAGA Region
14-8/2005		Inner Gulf of Thailand	Thailand	30 August 2005		- Training scientific echo sounder, bottom mapping sonar for TD staff
15-9/2005		Gulf of Thailand	Thailand	9 – 22 September 2005	CTD, TSG, PRR, Bongo net, Van Dorn water sampler	
16-10/2005		Cambodian waters	Cambodia	18 – 26 November 2005	CTD, TD, TSG, PRR, Bongo net, Core, Van Dorn water sampler	
17-1/2006		Andaman Sea	Thailand	12 January – 21 February 2006	CTD, TSG, Bongo net	
18-2/2006		West Coast of Peninsular	Malaysia	21 February – 21 March 2006	CTD, TSG, Bongo net, Grab, Core	
19-3/2006	1 2	Brunei Darussalam waters Brunei Darussalam waters	Brunei Darussalam Brunei Darussalam	29 May – 16 June 2006 18 June – 26 June 2006	CTD, TSG, Bongo net, Larvae net, Grab CTD, TSG, Bongo net, Larvae net	
20-4/2006		In the South China Sea of Indonesian waters	Indonesia	26 June – 18 July 2006	CTD, TSG, TD, Bongo net	
21-5/2006		Sulu Sea	The Philippines	19 September – 19 October 2006	CTD, TSG, Bongo net	
22-6/2006		Vietnamese waters	Vietnam	19 October – 18 November 2006	CTD, TD, TSG, Bongo net	

In addition to research works, in the year 2005 SEAFDEC also conducted training program onboard M.V. SEAFDEC 2 for Human Resources Development (HRD) on Marine Capture Fisheries in the BIMP-EAGA (Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area) Region for Indonesian, Malaysian and the Philippines researchers. The training covered the following issues:

For Indonesia researchers

1. Data collection using Bottom Trawl operation for distribution, composition and abundance of demersal fish study
2. Oceanographic practice using CTD
3. Plankton and larvae collection using Bongo net
4. Practice and analysis on stock assessment from Hydro-acoustic technique
5. Optional operation by squid jigging method for coastal squid sampling

For Malaysia researchers

1. Practice on demersal fish samplings in the un-trawlable grounds (Continental shelf and rocky grounds) using Bottom Vertical Long-line (BVL) and Trap fishing gear
2. Analysis on distribution, composition and abundance of demersal fish
3. Practice on pelagic fish samplings from the deep sea (beyond 50-80 nm from shore where depth is deeper than 200 m)
4. Oceanographic practice by CTD
5. Practice on plankton and larvae collection using Bongo net

For the Philippines researchers

1. Practice on demersal fish samplings in the un-trawlable grounds (Continental shelf and rocky grounds) using Bottom Vertical Long-line (BVL) and Trap fishing gear
2. Practice on demersal fish samplings using Bottom Trawl for distribution, composition and abundance of demersal fish study
3. Oceanographic practice by CTD
4. Practice on plankton and larvae collection using Bongo net
6. Practice on water and sediment samplings for heavy metal analysis
7. Gravity core sampling at Honda Bay

SEAFDEC Data Management

As information technology has developed rapidly and continuously, it is important to manage the data for the benefit and usefulness of the data and information. TD set up the Fisheries Information System (FIS) to develop the data management and information for each project, which appears on the SEAFDEC web site. FIS consists of information on Fishery oceanography, Fishery capture and biology, and Coastal Fishery Socio-economics.

The series of oceanographic data collection were derived from the research surveys, undertaken by SEAFDEC. After each cruise, the researchers who collected the data must send the digital data to the Fishing Ground & Fishery Oceanography Section. The responsible officers will adjust the data format and input into the database.

Due to the limitation of human resources, the data that are currently available on the SEAFDEC website are of M.V. SEAFDEC activities from 1994 – 2001 only. Now we

are trying to key in and store the data into our database and develop the webpage for searching on our data. Hopefully, the data of M.V. SEAFDEC from 2002 till present and data of M.V. SEAFDEC 2 will be available online as soon as possible.

Conclusion

SEAFDEC consider that the effective utilization of data and information, and good data management will be useful for all member country researchers. To achieve the SEAFDEC objectives, the development of data and information management systems giving valuable fisheries information to the region, though the SEAFDEC Fisheries Information system was recently initiated. However, For the long-term use of the SEAFDEC Fisheries Information system, SEAFDEC have to improve the technical skills of the officers concerned both researchers who collect the data and the database management officers to be more competent in their duties through the active participation in the international training courses, workshops and seminars.