UNITED NATIONS ENVIRONMENT PROGRAMME

REGIONAL SEAS

directories and bibliographies

marine environmental centres:

EAST ASIAN SEAS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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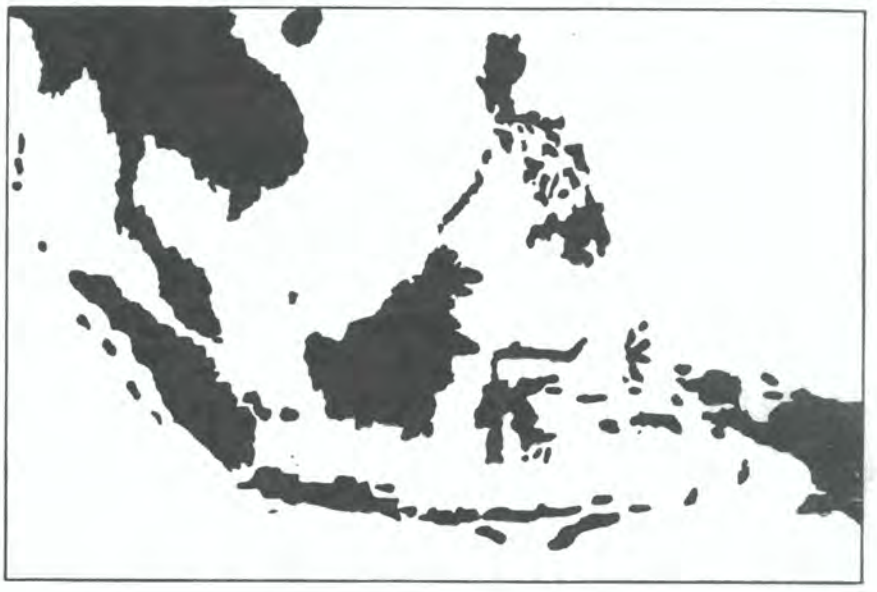

EAST ASIAN SEAS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome 1984

NOTE

This document is not an official publication but a compilation of information on marine research centres in East Asian Seas region. The designations employed and presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the secretariat of UNEP or FAO concerning the legal status of any State or Territory, or of its authorities, or concerning the delimitations of the frontiers of any State or Territory.

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PREFACE

The Regional Seas Programme was initiated by UNEP in 1974. Since then the Governing Council of UNEP has repeatedly endorsed a regional approach to the control of marine pollution and the management of marine and coastal resources and has requested the development of regional action plans.

The Regional Seas Programme at present includes eleven regions1/ and has over 120 coastal States participating in it. Each regional action plan is formulated according to the needs of the region as perceived by the Governments concerned, and is designed to link assessment of the quality of the marine environment, and of the causes of its deterioration, with activities for the management and development of the marine and coastal environment. The action plans promote the parallel development of regional legal agreements and of action-oriented programme activities2/.

This publication is a contribution to the UNEP sponsored regional Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Region adopted at the intergovernmental meetings convened by UNEP in Manila, 27-29 April 1981 and in Bangkok, 9-11 December 1981 3/.

This Directory, compiled under the auspices of the UNEP financed project (FP/0501-82-02), is a product of the Aquatic Sciences and Fisheries Information System (ASFIS) coordinated by Food and Agriculture Organization of the United Nations (FAO). FAO circulated questionnaires to marine environment institutes in the five States participating in the East Asian Seas Action Plan (Indonesia, Malaysia, the Philippines, Singapore and Thailand), collated the replies received and entered them into the Institutions Register of ASFIS, which had been modified to conform with Regional Seas needs.

The secretariats of UNEP and FAO apologize in advance for possible errors and omissions in the publication and do not claim that the directory includes all the relevant marine environmental centres of the East Asian Seas region. All comments on the present document, as well as suggestions for its expansion, should be addressed to:

The UNEP/FAO Project Coordinator
(Directories and Bibliographies)
Fisheries Department, FAO
Via delle Terme di Caracalla
00100 Roma (Italia)

1/ Mediterranean Region, Kuwait Action Plan Region, West and Central African Region, Wider Caribbean Region, East Asian Seas Region, South-East Pacific Region, South Pacific Region, Red Sea and Gulf of Aden Region, East African Region, South-West Atlantic Region and South Asian Seas Region

2/ UNEP: Achievements and planned development of UNEP's Regional Seas Programme and comparable programmes sponsored by other bodies. UNEP Regional Seas Reports and Studies No. 1 UNEP, 1982

3/ UNEP: Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region. UNEP Regional Seas Reports and Studies No. 24 UNEP, 1983

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Pusat Penelitian Sumber Daya Dan Lingkungan
Universitas Sumatera Utara

(Centre for Environmental Studies, University of North Sumatra (CES))

Executive officer DARDAK Abu: Director

Postal Address

Pusat Penelitian Sumber Daya Dan Lingkungan
Universitas Sumatera Utara
Jalan Prof. Mass No. 3A Kampus USU
MEDAN, NORTH SUMATRA

Telephone: 23210
Telex: 51753 USU MDN
Cable: PUSLIT SDL USU MEDAN

Working languages
Indonesian, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Pollution
Education, Training or Extension
Resources Management
Medicine

Areas of speciality
Coastal Marine Waters
Inland (Fresh) Waters
Petroleum Hydrocarbons
Brackish Waters
Mangroves Ecosystems

Objectives and programmes

Established in 1979, PKLH-USU is a university centre and one of a network of environmental centres throughout Indonesia, set up by the State Ministry for Population and Environment. Its aims are research, training and extension. Lack of equipment and manpower have, until recently precluded major research and monitoring programmes. The major research thrust associated with fisheries is concerned with understanding the environment of the coastal strip of the Malacca Straits, and this will continue into the forseeable future.

Cooperative programme

The Centre receives assistance from a UNDP/IBRD project for environmental training. The project is subcontracted to the Institute for Resource and Environmental Studies at Dalhousie University, Nova Scotia, Canada with which close ties are developing. The State Ministry for Population and Environment provides resources for research.

Training programme

The Centre provides general environmental training for local governmental staff. It is hoped to begin a Master's degree course in environmental management in 1984.

Institution structure
PKLH-USU is a centre within the Research Institute of the University of North Sumatra. Close ties are maintained with the State Ministry for Population and Environment.

Staff
13 Professional staff 0 Technical staff 3 Other staff

Professional scientific staff:

Name	Degree	Speciality
Abu Dardak	Ph.D.	Environmental management
Jazanul Anwar	Ph.D.	Environmental toxicology
Sengli Damanik	M.Sc.	Weed science
O.K. Nazaruddin Hisyam	M.S.	Environmental management
Menauli Tarigan	M.S.	Environmental management
Suyamsinar Jusuf	M.S.	Environmental management
Nasap Sembiring	M.P.H.	Public health
Guslim	M.S.	Environmental biology
Harwirta F. Eyanser	M.S.	Environmental biology
Djumil Ritonga	M.S.	Soil science
Syamsul Arifin	M.A.	Environmental law
Sjariful Aman	M.S.	Resource management
Ramlan H. Lubis	M.S.	Environmental biology

Premises/facilities
Building area: 500 m² Laboratory area: 50 m²
With facilities for:
Visiting Scientists: 1

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 2500
Number of periodical subscriptions:15

Monographs and serials titles:
To appear in 1984. 'The Ecology of Sumatran Ecosystems' in Indonesian and English.

Equipment
A wide range of general environmental field and laboratory equipment.

Institution code: 000050 Information received: 19/07/83

Universitas Gadjah Mada (UGM)

(Gadjah Mada University (GMU))

Executive officer SURYOWINOTO Moeso: Professor

Postal Address

Universitas Gadjah Mada (UGM)
Bulaksumur F/12
YOGYAKARTA, DIY

Telephone: 88688

Working languages
Bahasa Indonesia, Dutch, English, German

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Inland Fisheries
Aquaculture
Limnology
Microbiology
Pollution

Areas of speciality
Shrimps / Prawns
Algae
Micro-organisms
Plankton
Benthos
Coastal Marine Waters
Brackish Waters
Mangroves Ecosystems
Coral Ecosystems
Petroleum Hydrocarbons
Radionuclides

Objectives and programmes
History of institution, its mandate and purpose
Established with the ministerial decree (P.P. 37-1950) 19 December 1949.
Research, monitoring and other activities in the last three years
Baseline studies and monitoring along the River Donan, Cilacap (oil refineries), Central Java, Indonesia.
Major current research and other activities
Monitoring of the possible pollution at Pertamina refineries, Cilacap. Plant-tissue culture.
Future programmes
Continuation of current programme
Cooperative programme
Pertamina (Monitoring in Cilacap oil refineries); Directorate of fisheries (Water qualities and plankton, Tanjung Balai-Medan).
Training programme
1) Grafting from other Universities: Water ecology, terrestrial ecology. 2) Tree doctor degree (not in course): Mangrove ecology, shrimp culture. 3) Other courses: Ecology, pollution.

Institution structure
The Faculty of Biology, GMU. is divided into departments (Jurusan)
- Zoology (with the following laboratories): Anatomy, Physiology, Taxonomy, Embryology
- Botany (with the following laboratories): Botany-Anatomy, Plant Physiology, Plant Anatomy, Microtechnique
- Bio-Environment (with the following laboratories): Genetica, Biochemistry, Microbiology, Radiation Biology, Tissue Culture

Staff
47 Professional staff 46 Technical staff 31 Other staff

Professional scientific staff:

Name	Degree	Speciality
Gembong Tjitrosoepomo	IR (Agric. eng.)	Plant taxonomy, Plant geography
Moeso Suryowinoto	IR (Agric. eng.)	Radiation biology, Plant tissue culture
Suryo Sodo Adisewoyo	IR (Agric. eng.)	Genetics, Cytogenetics
Wibisono Soerodikoesoemo	Ph.D.	Plant anatomy, Plant embryology, Plant microtechnics
Margono Partodidjojo	IR (Agric. eng.)	Plant physiology
Soeparmi Soerahyo	DRA	Animal anatomy
Soetjipta	M.Sc.	Ecology, Limnology, Planktonology
Soenarto Hardjosoewarno	DRS	Plant taxonomy, Plant ecology
Soesarsi Sabbithah	DRA	Plant taxonomy,

Staff (Cont.)

Name	Degree	Speciality
		Phycology, Marine biology
Santosa	DR	Plant physiology, Ecophysiology
Sri Sulasti Dalidjan	DRA	Plant taxonomy, Pteridology, Bryology
Nurtjahjo	DRS	Radiation biology
I.G.P. Badjra Sidemen	DRS	Microbiology
Anthon Sukahar	DRS	Animal taxonomy
Harminani S. Djalal Tandjung	DRA	Animal anatomy
Sutiarti Supandi	DRA	Animal taxonomy
Santianawati	DRA	Animal taxonomy, Entomology
Susilo Handari Suntoro	DRA	Animal anatomy
Mardjiyah Mardjiyo	DRA	Animal taxonomy
Mammed Sagi	DRS	Animal embryology
Kistinah Sugihardjo	DRS	Histology
Issirep Sumardi	DRA	Plant anatomy, Plant embryology
Th. Tri Suharni Mulyadi	DRA	Microbiology, Food microbiology
Shalihuddin Djalal Tandjung	Ph.D.	Environmental sciences, Pollution ecology
Soesilo	DRS	Animal taxonomy
Agus Pudjoarinto	Post Grad.(S.2)	Plant (vascular) taxonomy
Jusup Subagja	Ph.D.	Ecology, Soil zoology
Istriyati	DRA	Histology
Suharno	DRS	Animal physiology
Th. M.A. Sri Wulaningsih S.	DRA	Plant anatomy
Slamet Sutanti Budirahayu N.	M.Sc.	Plant (vascular) taxonomy
Ali Usodo Mulyo	DRS	Animal physiology
Mochamad Nasir	DRS	Plant physiology
Sri Juni Nastiti Sunardi	DRA	Microbiology
Hari Hartiko	Ph.D.	Biochemistry
Bambang Prayitno	DRS	Biochemistry
Sukarti Mulyopawiro	M.Sc.	Biochemistry
Jesmandt Situmorang	Ph.D.	Animal taxonomy, Entomology
Agnes Endang Sutariningsih Sutarto	DRA	Microbiology, Biotechnology
Nyoman Puniawati Soesilo	Post Grad.(S.2)	Animal anatomy
S.M. Issugianti R.	DR	Histology, Microtechnique, Cell biology
Yohanes Sugiyanto	DRS	Animal anatomy
Tjut Sugandawaty Djohan	DRA	Ecology
Retno Peni Sancayaningsih	DRA	Ecology
Suharyanto	DRS	Plant anatomy
Sutikno	DRS	Plant anatomy
Purnomo	DRS	Plant taxonomy

Premises/facilities

Building area: 1612 m² Laboratory area: 1140 m²

With facilities for:

Visiting Scientists: 2 Students: 731

Aquarium facilities

Species maintained for experimental purposes:

Saccharum officinarum	*Gnetum gnemon*	*Salacca edulis*
Nanda spp.	*Mus musculus*	*Mabouya multifasciata*
Cavia cobaya	*Columba livia*	*Rana limnocharis*
Bufo spp.	*Rattus rattus*	*Lepus sp.*
Gecko sp.	*Gallus bankiva*	*Cyprinus carpio*
Tilapia mossambica	*Daphnia sp.*	*Macaca ipus*

Institution code: 000051 Information received: 06/09/83

Jawatan Hidro-Oseanografi (JANHIDROS)

(Hydro-Oceanographic Office)

Executive officer KATOPPO, Levinus P.: Chief Hydrographer

Postal Address

Jawatan Hidro-Oseanografi (JANHIDROS)
Jalan Gunung Sahari 87
JAKARTA, 10610

Telephone: 364157/349138
Telex: 49124 (PREFIX: UP. JANHIDROS)

Working languages
Indonesian, English

Nature of institute
Inter-Governmental Governmental

Main fields of activities

Oceanography	Physical Sciences
Pollution	Meteorology / Climatology
Geography	Geology (incl. Sedimentology)
Mutual Assistance / Technology Transfer	Education, Training or Extension

Areas of speciality

Thermal	Tide / Waves
Wind	Offshore Marine Waters
Coastal Marine Waters	Brackish Waters
Inland (Fresh) Waters	

Objectives and programmes
History of institution, its mandate and purpose
From 1945 - 1960 the hydrographic and oceanographic matters of Indonesia were handled by the Ministry of Communication and by the Naval Department, Ministry of Defence. In 1960 hydrographic service became a part of Indonesian Navy. The principal functions are hydrographic services, oceanographic research, publication of nautical charts, lists of lights, tide and tidal stream tables, notices to mariners etc.
Research, monitoring and other activities in the last three years
- Joint hydrographic and magnetic survey USA-Indonesia in Makassar, Lombok and Sunda Straits
- Ocean thermal energy conversion (OTEC) survey in Bali sea
- Hydrographic and oceanographic surveys in several areas of Indonesian waters (about 45 places)

Major current research and other activities
- Hydrographic and oceanographic surveys
- Publication of nautical charts, list of lights, tide and tidal stream tables, notices to mariners, etc.

Future programmes
- Hydro-oceanographic research (Snellius expedition)
- Publication and updating of nautical charts

Cooperative programme
- International Hydrographic Organization (IHO)
- East Asian Hydrographic Commission (EAHC)
- South China Sea Hydrographic Commission (SCSHC)
- Inter-Governmental Maritime Organization (IMO)

Training programme
- Hydrographic course

Institution structure
Jawatan Hidro-oceanografi (JANHIDROS); Hydro-Oceanographic Office consists of:
- Chart Division
- Survey Division
- Marine Environment Division
- Geodesy Division
- Data Center
- External Affairs Section
- Hydrographic Vessels Unit

Staff
87 Professional staff 212 Technical staff 312 Other staff

Professional scientific staff:

Name	Degree	Speciality
Col. R. Widodo		Hydrographer
Col. Sjamsul Bachri		Hydrographer
Lt. Col. Roestamadji		Hydrographer
Col. Soelardi		Hydrographer
Lt. Col. Ebe Hamdan		Hydrographer
Col. A. Muhammad P.		Hydrographer

Staff (Cont.)

Name	Degree	Speciality
Lt. Col. Rachmat B.		Geographer
Major Sofyan Rawi		Oceanographer

Premises/facilities
Building area: 3526 m² Laboratory area: 1418 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 2500

Monographs and serials titles:
- Nautical charts
- Light list
- Tide and tidal stream tables
- Notices to mariners (weekly)
- Sailing directions

Equipment
Positioning equipment (Hyperfix; Trisponder 202/520/540; telluro-meter MRA 3/MRA 5; geodimeter AGA), Echosounders (Atlas Deso 10/20; Kelvin Hughes MS 45/48; Echotrack; Side Scan Sonar/Klein), Oceanographic equipment (tide guage A OTT/LPT-2/OGAWA; current meter Toho Denta NC.II; salinometer - NBA; CTD; bathythermograph), Geodetic equipment (Geoceiver Magnavox MX 1502; theodolite Wild T2/T0/T3; level Wild N2), Meteorological equipment, Cartographic equipment (Pantophot; coordinatograph; phototype; contact print; camera repro; Diazo printing machine; film cutter; lettering machine and other cartographic instruments).

Research craft

Name:	KRI BURUJULASAD
Owner:	Indonesian Navy
Date of construction:	1966
Crew:	100
Scientists:	12

Name:	KRI JALANIDHI
Owner:	Indonesian Navy
Date of construction:	1962
Crew:	74
Scientists:	8

Institution code: 000052 Information received: 20/02/84

Lembaga Oseanologi Nasional (LON)

(National Institute of Oceanology)

Executive officer SOEGIARTO Aprilani: Director

Postal Address

Lembaga Oseanologi Nasional (LON)
Jalan Pasir Putih No. 1 Ancol Timur
P.O. Box 580/DAK
JAKARTA-UTARA

Telephone: 683850
Cable: LONAS

Working languages
Indonesian, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Marine Fisheries
Aquaculture
Oceanography
Microbiology
Pollution
Geology (incl. Sedimentology)
Education, Training or Extension

Areas of speciality
Demersal Fish
Pelagic Fish
Other Vertebrates
Shrimps / Prawns
Other Invertebrates
Algae
Micro-organisms
Plankton
Benthos
Tide / Waves
Offshore Marine Waters
Coastal Marine Waters
Mangroves Ecosystems
Coral Ecosystems
Metals
Nutrients

Objectives and programmes

History of institution, its mandate and purpose

Originally founded in 1904 as Fishery Laboratory, the National Institute of Oceanology was officially established in 1970 and is under the Indonesian Institute of Sciences (LIPI). The main laboratories are located in Jakarta and are called National Institute of Oceanology. The Institute conducts research on biological aspects related to living resources. The Institute has a research station on Ambon Island, whose task is to carry out biological and oceanographical investigations in Maluku waters, especially in Ambon Bay, and a research station on Pari Island, off Jakarta, which performs research activities in the Jakarta Bay and the Thousand Islands.

Research, monitoring and other activities in the last three years

Occasional measurements of essential nutrients like nitrates, phosphates, etc. are carried out in areas where pollutants are generally released. Biological studies of certain economically important marine organisms. Inventory of marine organisms.

Major current research and other activities

Oceanographic research in the Indonesian waters; biological studies of certain marine organisms of economic importance; mariculture research of algae and crab; ecological research in several bays and the inventory of marine organisms. The Institute also conducts occasional feasibility studies on contracts from industries and governmental agencies in the matter of disposal of sewage and effluents.

Future programmes

In addition to the current activities it has been planned to take up studies on heavy metals in sewage and effluents in collaboration with Indonesian Petroleum Institute (LEMIGAS) where instrumental facilities are available for the purpose.

Cooperative programme

The Institute cooperates with the National Organization for Surveys and Mapping (BAKOSURTANAL) and the Indonesian National Institute of Aeronautics and Space (LAPAN) in remote sensing activities using VIZ and IR photography in the coastal area. Also with other research and educational institutions, on certain aspects of marine research.

Training programme

Only for research students from Universities having joint agreement in educational programme (no dormitory), and short period training courses on certain aspects of marine research.

Institution structure

Oceanographic Research Centre:	physical, chemical, geological studies
Biological Research Centre:	zoology, botany and reference collection

Institution structure (Cont.)

Ecological Research Centre:	**environmental studies and mariculture**
Ambon Research Station: (Ambon Island)	**oceanography, biology and ecology**
Pari Research Station: (Pari Island)	**biology, oceanography and mariculture**

Staff

84 Professional staff 95 Technical staff 163 Other staff

Professional scientific staff:

Name	Degree	Speciality
Abdul Gani Ilahude	Ph.D.	Oceanography
Abdul Samad Genisa	M.S.	Ichthyology
A.B. Sutomo	M.Sc.	Zooplankton
Andi Victor Toro	M.S.	Crustacea
Antonius Suwardi	M.S.	Marine geology
Anugerah Nontji	M.S.	Primary productivity
Aprilani Soegiarto	Ph.D.	Primary productivity
Asikin Djamali	M.S.	Ichthyology
Atjep Suwartana	M.S.	Mathematics
Aznam Aziz	M.S.	Corals
Bambang S. Sudibjo	M.S.	Statistics
Bambang Sudjoko	M.S.	Molluscs
Burhanuddin	M.S.	Ichthyology
Daniel Sapulete	M.S.	Oceanography
Deddy Setapermana	M.S.	Primary productivity
Dharma Arief	M.S.	Physical oceanography
Djoko Prawoto Praseno	B.Sc.	Phytoplankton, Remote sensing
Dwi Listyo Rahayu (Ms)	M.S.	Marine biology
Hadikusumah	M.S.	Physical oceanography
Hamidah (Ms)	M.S.	Chemical environment
Harsono	M.S.	Corals
Horas P. Hutagalung	M.S.	Chemical environment
Idjin Suryana	M.S.	Physical oceanography
Indra Aswandy	M.S.	Crustacea
Kasijan Romimohtarto	Ph.D.	Crustacea
Kastoro	B.Sc. Hons.	Physical oceanography
Kurnaen Sumadiharga	M.S.	Marine biology
Lukman Effendy	M.S.	Marine geology
Malikusworo Hutomo	M.S.	Ichthyology
Manuputty Ana (Ms)	M.S.	Marine biology
Maria G. Lily (Ms)	M.S.	Mariculture
Memet Hermady	B.Sc.	Chemical oceanography
M. Kasim Moosa	Ph.D.	Crustacea
Mohamad Adrim	M.S.	Ichthyology
Muh. Husni Azkab	M.S.	Marine biology
Muswerry Michtar	M.S.	Chemical oceanography
O.H. Arinardi	M.S.	Zooplankton
Otto Sudarmadji	M.S.	Marine geology
Pardomuan Sianipar	M.Sc	Mariculture
Pranoto Hamidjojo	B.E.	Marine geology
Prapto Dharsono	B.Sc	Corals
Quraisyin Adnan (Ms)	M.S.	Phytoplankton
Ruyitno	M.S.	Microbiology
Sam Wouthuyzen	M.S.	Marine biology
Sigit Anggoro Putro	M.S.	Marine biology
Siswandono	M.S.	Marine geology
Soeminarti S. Thayeb (Ms)	M.S.	Microbiology
Sri Juwana (Ms)	M.S.	Mariculture
Subardi	B.E.	Marine geology
Subagjo Soemodihardjo	Ph.D.	Molluscs
Sujatno Birowo	M.Sc.	Physical oceanography, Meteorology
Sukarno	Ph.D	Corals
Sularto Martosewojo	M.S.	Ichthyology
Sulistijo	M.S.	Mariculture
Sutomo (Ambon)	M.S.	Plankton
Sutomo (Jakarta)	M.S.	Mariculture
Walman Hutahaen	M.S.	Oceanography
Wanda S. Atmadja	M.S.	Algae
Wawan Kiswara	M.S.	Corals
Wenno Lucas Frederik	M.S.	Oceanography
Woro Widiarsih Kastoro (Ms)	M.S.	Molluscs
Achmad Kadi	M.S.	Marine biology
Djoko Kunarso	M.S.	Microbiology
Edy Yusron	M.S.	Marine biology
Etty Triyati	M.S.	Chemical environment
Helfinalis	M.S.	Marine geology
Hermanto	M.S.	Remote sensing
Dwi Eny Djoko Setiono	M.S.	Marine biology

Staff (Cont.)

Name	Degree	Speciality
I. Nyoman Sutarna	M.S.	Marine biology
Indrawan Prihartono	M.S.	Mathematics
Heryanto	M.S.	Marine biology
Kresno Yulianto	M.S.	Marine biology
Ngurah Nyoman Wiadnyana	M.S.	Marine biology
Nurdin Manik	M.S.	Marine biology
Marodjahan Simanjuntak	M.S.	Chemical oceanography
Pramudji	M.S.	Marine biology
Peggy Zosa Zen	M.S.	Marine biology
Suroyo	M.S.	Marine biology
Sakimin Suprapto	M.S.	Marine biology
Sunarto	M.S.	Marine biology
Salam Tarigan	M.S.	Physical oceanography
Teguh Pristiwadi	M.S.	Marine biology
Tono Saputro	M.S.	Mathematics
J.M. Manik	B.Sc.	Chemical oceanography

Premises/facilities
Building area: 2900 m² Laboratory area: 1900 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 12860
Number of periodical subscriptions: 11

Monographs and serials titles:
- Marine Research in Indonesia (in English, published regularly)
- Oseanologi di Indonesia (in English or in Indonesian, three issues per year)
- Oceanographical Cruise Report (in English, 2-3 issues per year)
- Newsletter 'OSEANA' (in Indonesian, 6 issues per year)

Equipment
Atomic absorption spectrophotometer, spectrophotometer, salinometer, analytical balance, minicomputer, centrifuge, photographic equipment, microscopes, current meter, STD, MBT.

Aquarium facilities
Total area: 40 m² Number of tanks: 2

Organisms maintained:

Demersal Fish	Pelagic Fish	Molluscs
Crustaceans	Algae	Micro-organisms

Species maintained for experimental purposes:

Euchema edule	*Euchema serra*	*Euchema spinosum*
Gracilaria conferoides	*Gracilaria lichinoides*	*Siganus gittatus*
Siganus canoliculatus	*Siganus virgatus*	*Portunus pelagicus*
Mytilus viridis	*Chlorela sp.*	*Tetraselmis sp.*
Brachionus plicatilis		

Research craft

Name:	SAMUDERA
Owner:	National Institute of Oceanology
Length:	36 m.
Type:	vessel
Date of construction:	1952
Crew:	26
Scientists:	5
Lab. space:	20 m2

Special facilities:
Echosounder, hydraulic winch, radar, radio equipment, oceanographic instruments and bottom sampling equipment i. e. dredge, grab, etc.

Name:	MUTIARA
Owner:	National Institute of Oceanology
Length:	10 m.
Type:	vessel
Date of construction:	1973
Crew:	6
Scientists:	3

Special facilities:
Hand winch

Institution code: 000053 Information received: 01/07/83

Balai Penelitian Perikanan Laut (BPPL)

(Research Institute for Marine Fisheries (RIMF))

Executive officer MARTOSUBROTO Purwito: Director

Postal Address

Balai Penelitian Perikanan Laut (BPPL)
Jalan Krapu 12, Sunda Kepala
JAKARTA-UTARA

Telephone: 679935/679191

Working languages
Indonesian, English

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Resources Management
Fishing Technology	Pollution
Marketing / Economics	Social Sciences

Areas of speciality

Demersal Fish	Pelagic Fish
Other Vertebrates	Cephalopods
Lobsters	Shrimps / Prawns
Other Invertebrates	Algae
Coastal Marine Waters	Mangroves Ecosystems
Coral Ecosystems	Metals
Nutrients	

Objectives and programmes

History of institution, its mandate and purpose
The Institute was established in 1961. Its mandate is to conduct research in marine fisheries. It provides information on the resources as well as on the status of their exploitation.

Research, monitoring and other activities in the last three years
Research and monitoring activities have been in the area of tuna fisheries, shrimp fisheries, sardine fisheries and demersal fisheries.

Major current research and other activities
Current research have been in the area of monitoring survey in the north coast of Java and Bali Strait with respect to the pelagic fishery.

Future programmes
Future research will be tuna tagging program in the Pacific area.

Cooperative programme
Cooperative programme in progress are:
- Mariculture research with Japanese International Cooperation Agency (JICA)
- Pelagic resources survey in the area of South China Sea and Sulawesi Sea with FAO-CIDA
- Assessment of biological parameters of tropical fishes with ICLARM

Institution structure
- Director
- Research Groups:
  Demersal
  Small Pelagic
  Shrimp
  Tuna
  Fishing Gear and Methods
  Socio-Economics
- Administration
- Stations

Staff
43 Professional staff 79 Technical staff 86 Other staff

Professional scientific staff:

Name	Degree	Speciality
Tatang Sujastani	M.Sc.	Fisheries biology
Nurzali Naamin	Ph.D.(student)	Fisheries biology, Shrimps
Gede S. Merta	M.Sc.	Fisheries biology, Pelagic fisheries
Subhat Nurhakim	M.S.	Fisheries biology, Pelagic fisheries
J. Widodo	Ph.D.(student)	Fisheries biology, Demersal fisheries

Staff (Cont.)

Name	Degree	Speciality
M. Fatuchri	M.S.	Marine culture, Oyster, fish
W. Ismail	B.S.	Marine culture, Oyster, fish
C. Nasution	B.S.	Fishing gear technology
H.R. Barus	IR (B.S.Honours)	Fishing gear technology
E.M. Amin	IR (B.S.Honours)	Fishing gear technology
M. Badrudin	IR (B.S.Honours)	Fisheries biology, Demersal fisheries
A. Dwiponggo	IR (B.S.Honours)	Fisheries biology, Demersal fisheries
J.C.B. Uktolseja	IR (B.S.Honours)	Fisheries biology, Tuna resources
W. Subani	DRS (B.S.Honours)	Fisheries biology

Premises/facilities
Building area: 1643 m² Laboratory area: 1338 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 414
Number of periodical subscriptions:93

Monographs and serials titles:
'Laporan Penelitian Perikanan Laut' (Marine Fisheries Res. Report)

Equipment
3 fibreglass boats (7-10m) used for mariculture activities.

Aquarium facilities

Organisms maintained:
Demersal Fish Molluscs Micro-organisms

Species maintained for experimental purposes:

Siganus canaliculatus	*Siganus virgatus*	*Siganus guttatus*
Lutjanus sanguineus	*Epinephelus tauvina*	*Lethrinus sp.*
Perna viridis	*Crassostrea erudele*	*Anadara inflata*
Isochrysis sp.	*Chlorella sp.*	*Skeletonema sp.*
Tetraselmis sp.	*Monochrysis sp.*	*Lutjanus johni*

Research craft

Name:	BAWAL PUTIH I
Owner:	Directorate General of Fisheries
Length:	29 m.
Type:	trawler
Date of construction:	1974
Crew:	15
Scientists:	6
Lab. space:	12 m2

Name:	MUTIARA IV
Owner:	Directorate General of Fisheries
Length:	22 m.
Type:	trawler
Date of construction:	1974
Crew:	8
Scientists:	4
Lab. space:	8 m2

Name:	PENELITIAN I
Owner:	RIMF
Length:	14 m.
Type:	gillnetter
Date of construction:	1979
Crew:	7
Scientists:	2

Name:	KRAPU
Owner:	RIMF
Length:	8 m.
Type:	gillnetter
Date of construction:	1979
Crew:	6
Scientists:	2

Institution code: 000055 Information received: 15/11/83

Pusat Penelitian Pengembangan Teknologi Minyak dan Gas Bumi 'LEMIGAS' (PPPTMGB)

(Research and Development Center for Oil and Gas Technology 'LEMIGAS')

Executive officer WISAKSONO Wahjudi: Head

Postal Address

Pusat Penelitian Pengembangan Teknologi Minyak
dan Gas Bumi 'LEMIGAS' (PPPTMGB)
Cipulir, Kebayoran Lama
P.O. Box 89 JKT
JAKARTA

Telephone: 734422
Telex: 47150, 47172

Working languages
Indonesian, English

Nature of institute
Governmental

Main fields of activities
Chemical Sciences
Offshore Technology
Engineering
Mineral Resources (incl. Oil)
Social Sciences
Education, Training or Extension
Physical Sciences
Pollution
Geology (incl. Sedimentology)
Policy and Planning
Computer / Information Systems

Areas of speciality
Pelagic Fish
Mineral Oil
Offshore Marine Waters
Brackish Waters
Metals
Benthos
Thermal
Coastal Marine Waters
Petroleum Hydrocarbons

Objectives and programmes
History of institution, its mandate and purpose
PPTMGB 'LEMIGAS' was founded in 1965 as the scientific arm of the Directorate General of Oil and Gas, Department of Mines and Energy. It is a training and research institution and has the following objectives:
- to support and accelerate the Indonesian development
- to stimulate the processing of the natural resources from raw materials into basic material for industrial and export purposes

Research, monitoring and other activities in the last three years
- Inventory and analysis of the national regulation and law concerning the marine oil pollution abatement
- Socio-economic study on the regional development where oil activities exist
- Oil contamination effects to soil

Major current research and other activities
- Oil pollution survey and monitoring
- Toxicity tests (dispersants, effluents and other chemical agents)
- Oil analysis
- Environment impact analysis
- Oil spill simulation modeling
- Oil and gas reservoir simulation modeling
- Supply and demand energy model
- Basin study

Future programmes
Continuation of current programme

Cooperative programme
The study group on pollution is having active cooperative research programmes with major universities and institutions in Indonesia on aspects such as marine sciences, legislation, socio-economics and others concerning pollution and environment.
It also collaborates with foreign institutes such as FAO/UNEP project, University of Wisconsin and East West Center in Honolulu.

Training programme
No programmes for graduate, postgraduate or doctorial studies. Approximately 400 students for undergraduate studies are accepted and accomodated in the hostels. The accademy has complete education facilities including oil fields, workshops and a small refinery for practical training.

Institution structure
LEMIGAS is organized in 6 divisions:
- Exploration and Exploitation (Training)
- Process and Application (Training)
- Exploration and Exploitation (Research)
- Process and Application (Research)
- Data and Information

Institution structure (Cont.)
- General Services

Exploration and Exploitation research divisions have the following groups:
- Geology
- Stratigraphy and Sedimentology
- Geophysics
- Geochemistry
- Formation Evaluation
- Reservoir
- Production Rate
- Production Engineering
- Field Services

Process and application research division has the following groups:
- Process
- Application
- Techno-economic
- Engineering
- Environmental and Cross-sectorial

There is also a Study Group on Pollution established in 1971 and managed by the Environmental and Cross-sectorial Research Group

Staff

457 Professional staff 0 Technical staff 2359 Other staff

Professional scientific staff:

Name	Degree	Speciality
Wahjudi Wisaksono	Prof. Ph.D.	Chemist
Sumardi Sastrakusumah	Prof. Ph.D.	Biologist
Aprilani Soegiarto	Ph.D.	Oceanologist
Asikin S. Djanegara	M.Sc.	Mechanical engineering
Henk Uktolseya	M.Sc.	Hydro-meteo oceanographer
Soetjipto Wirosardjono	M.Sc.	Statistician
Jasjfi, E.	M.Sc.	Chemical technologist
Rachman Soebroto	Ph.D.	Chemist
Muljono	Ph.D.	Chemist
Jaspal Bilal	Dipl. Chem.	Chemist
Moeljono	M.Sc.	Chemist
Irwandi Bachtiar	Dipl. Est.	Fisheries engineer
Bambang Prasetyo	M.Sc.	Fisheries engineer
Gunawan Oetomo, R.	M.A.	Lawyer
Soedarmadji S.	M.A.	Sociologist
Evita H. Legowo	M.Sc.	Chemist
Soehardono, E.	M.Sc.	Chemist
Soepanto Wibisono, M.	B.Sc.	Biologist
Darwita	M.Sc.	Chemist

Premises/facilities

With facilities for: Laboratory area: 13560 m²

Students: 400

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 11000
Number of periodical subscriptions:153

Monographs and serials titles:
- Lembaran Publikasi Lemigas (published threemonthly since 1976 in Indonesian on petroleum research and related subjects)
- Laporan Berita Minyak (published weekly in Indonesian, containing current information on petroleum taken from daily national and international news)
- Berita Lemigas (published fortnightly, in Indonesian on personal events)
- Scientific Contribution (published in English on petroleum research and related subjects)
- Caraka Lingkungan (published bimonthly, in Indonesian or in original language on request on environment and pollution problems, particularly caused by petroleum), since 1982 is integrated into the Lembaran Publikasi Lemigas

Equipment

UV-VIS and IR spectrophotometers, atomic absorption spectrophotometer with Hg analyser, gas liquid chromatographs, field photometric analyser for DO, pH, oily matter, nutrients etc., mass spectrograph, speed and direction current meter, automatic composit liquid sampler, echosounder, aquatic biota samplers, fluoro spectrophotometer, ICP spectrometer, scanning electron microscope.

Aquarium facilities
Total area: 150 m² Number of tanks: 90

Organisms maintained:
Demersal Fish Pelagic Fish Molluscs
Crustaceans

Species maintained for experimental purposes:

Anadara granosa *Tilapia mosambica* *Chanos chanos*

Research craft
Name: NONE
Owner: PPTMB 'LEMIGAS'
Type: speedboat
Crew: 2

Institution code: 000056 Information received: 19/09/84

Balai Budidaya Air Payau (BBAP)

(Brackishwater Aquaculture Development Centre (BADC))

Executive officer RANOEMIHARDJO Bambang Salamoen: Director

Postal Address

Balai Budidaya Air Payau (BBAP)
Taman Pemandian Kartini
P.O. Box 1
JEPARA, CENTRAL JAVA

Telephone: 125
Cable: UDANG, JEPARA

Working languages
Indonesian, English

Nature of institute
Governmental Academic

Main fields of activities
Aquaculture
Education, Training or Extension
Pollution

Areas of speciality
Demersal Fish
Algae
Brackish Waters
Metals
Shrimps / Prawns
Plankton
Mangroves Ecosystems
Halogenated Hydrocarbons

Objectives and programmes

History of institution, its mandate and purpose

The Shrimp Culture Research Centre was established at Jepara, Central Java, in 1971 with the objective to develop improved technology for increased production. To supplement national effort the Government obtained assistance from the United Nations Development Programme and the Food and Agriculture Organization (Project INS/72/003) from September 1972 through the Brackishwater Shrimp and Milkfish Culture Applied Research and Training Project. Since 1976 the name of the Centre changed into Brackishwater Aquaculture Development Centre with the objective to developing improved technology for increased production, demonstration of and training in culturing brackishwater species.

The Centre performs unrestricted research in all disciplines of developing improved technology for increased fish and shrimp production.

The objectives of the institution are:

- Developing improved techniques for increased production of milkfish and shrimp in ponds
- Standardizing techniques for successful spawning and mass rearing of Penaeid shrimp larvae and the giant freshwater prawn in hatcheries
- Enhancing collection of shrimp and milkfish fry from natural sources by improving collection gear, handling storage and transportation techniques as well as prospecting and locating new collection grounds
- Evolving dependable methods of seed production through maturation and spawning of milkfish and shrimps in captivity
- Evolving suitable, cheap formula feeds for milkfish and shrimp for various stages of growth
- Testing and monitoring pesticides levels in brackishwater environment and suggesting measures for control as necessary
- Imparting training in improved fish culture methods for fishery extension officers and farmers
- Extending demonstration of improved methods to pond farmers to encourage them to adopt methods for increased pond production

Research, monitoring and other activities in the last three years

The Centre has accomplished research activities dealing with:

- Observations on diseases affecting shrimp culture in Jepara
- Results on pond culture of penaeid shrimps at the Jepara Centre in 1980/1983
- Effect of stocking density on the rate of growth of fry and fingerling of milkfish (*Chanos chanos*)
- Polyculture of milkfish (*Chanos chanos*) and shrimps (*Penaeus monodon*), siganids (*Siganus* spp.) and shrimp (*Penaeus monodon*) to increase production in brackishwater ponds
- Culture of the white shrimp (*Penaeus merguiensis*) at the Jepara Centre
- The effect of high salinity on growth and survival of the giant tiger shrimp (*Penaeus monodon*) under cultivation in the brackishwater ponds
- The possible use of some agricultural waste products as organic fertilizers in shrimp and milkfish ponds
- Preliminary study on the culture of the giant freshwater prawn (*Macrobrachium rosenbergii*)

Objectives and programmes **(Cont.)**

- **Result of giant freshwater prawn** (*Macrobrachium rosenbergii*) culture in the fish farmer ponds
- Effect of organic liquid fertilizers on the growth of milkfish (*Chanos chanos*) and shrimp (*Penaeus monodon*) in brackishwater pond
- Survey on site locations for penaeid shrimp hatchery and penaeid growing pond requested by private companies

Major current research and other activities

Same as in the last three years

Future programmes

Supervision of the 3 sub-centres under construction.

- Increasing production efforts in brackishwater ponds through intensive culture
- Study of new species for brackishwater culture
- Transfer of technology

Cooperative programme

The Centre is having cooperative research programmes with other major institutions and universities in Indonesia and abroad on different aspects of brackishwater fish and shrimp culture.

Training programme

Brackishwater aquaculture aspects (undergraduate and graduate levels)

Institution structure

The Centre is divided as follows:

- Administration Division (Finance section, Personnel affairs section, General affairs section)
- Seed Production Division (Shrimp seed section, Fish seed section)
- Handling and Transportation of Seed Section (Live food culture section)
- Culture Technique Division (Milkfish culture section, Shrimp culture section, Polyculture section, Artemia section, Artificial food section)
- Monitoring and Environmental Conservation Division (Pest and disease control section, Water and soil quality section)
- Service (Consultancy and contract survey)

Staff

16 Professional staff 33 Technical staff 85 Other staff

Professional scientific staff:

Name	Degree	Speciality
Ranoemihardjo, Bambang S.	Master Degree	Fish and shrimp culture
Mintardjo, Kisto	Master Degree	Environmental conservation
Nurdjana, Made L.	Master Degree	Shrimp seed production
Sudjiharno	Master Degree	Milk fish culture
Sunaryanto, Anto	Master Degree	Pest and disease control
Kusnendar, Endhay	Master Degree	Shrimp culture
Noor Hamid	Master Degree	Seed handling, Transportation
Sudjiharno, Anindiastuti (Ms)	Master Degree	Shrimp seed production
Kusnendar, Iin S. Djunaidah	Master Degree	Fish feed formulation
Pujiatno	Master Degree	Plankton culture
Utaminingsih (Ms)	B.E.	Water soil quality
Sumeru, Sri Umiyati (Ms)	Master Degree	Artemia culture
Kuntijo	B.Sc.	Polyculture

Premises/facilities

Building area: 370 m² Laboratory area: 750 m²

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 4347
Number of periodical subscriptions:89

Monographs and serials titles:

- Annual Report, 1982 (Indonesian)
- Periodic Bulletin (English, 2 times a year, on exchange, last issue in 1982: Vol.7, No.1 and 2, 1981)

Equipment

Microscope, phase contrast and drawing accessories, balances, centrifuge, salinity refractometers, oxygen meter, Hach field laboratory, photoelectric calorimeter conductivity meter, pH meter, recording thermometer, electric centrifuge, precision balances, Kjeldhals distillation unit, hot air oven, gas-chromatograph (Tracor), spectrophotometer (Beckman), vacuum freeze-drying unit, Soxhlet extraction units (electric), rotating evaporator, all-glass distillation units, still camera (35 mm), 8 and 16 mm movie camera and accessories, overhead projector, epidiascope, 80 glass aquaria (60 l each) 20 glass aquaria (80 l each), California pellet mill, ginder, mixer, pellet crumbler, pellet screener, boiler, flake,

Equipment (Cont.)
food machine, Gestetner 211 offset printing machine, photograph reproduction camera.

Aquarium facilities
Total area: 1500 m² Number of tanks: 68

Organisms maintained:
Demersal Fish Crustaceans Other Invertebrates

Species maintained for experimental purposes:

Chlorella sp.	*Skeletonema sp.*	*Tetraselmis sp.*
Artemia salina	*Macrobrachium rosenbergii*	*Penaeus merguiensis*
Penaeus monodon	*Chanos chanos*	*Lates calcarifer*
Mugil spp.	*Siganus spp.*	

Research craft
Name: K.M. WINDU
Owner: BADC-Directorate Gen. of Fisheries
Length: 14 m.
Type: Trawler
Date of construction: 1974
Crew: 6
Scientists: 1
Special facilities:
SSB (25 Watts), fish finder (2-15 MHz), trawl winch

Institution code: 000057 Information received: 12/09/84

Badan Koordinasi Survey dan Pemetaan Nasional (BAKOSURTANAL)

(National Coordination Agency for Surveys and Mapping)

Executive officer RAIS Jacub: Chairman

Postal Address

Badan Koordinasi Survey dan Pemetaan Nasional (BAKOSURTANAL)
Jalan Raya Bogor, km 46,
P.O. Box 46/CBI
CIBINONG,BOGOR

Telephone: 82062-67
Telex: 48305 BAKOST IA

Working languages
Indonesian, English

Nature of institute
Governmental

Main fields of activities
Geography Geology (incl. Sedimentology)

Areas of speciality
Offshore Marine Waters Coastal Marine Waters

Objectives and programmes
History of institution, its mandate and purpose
Established by presidential decree No. 83 of 1969 the Agency's goal is to prepare a basis for national inventory and evaluation of resources by updating through surveys and mapping of the whole country. The activities related to marine environment are: marine geodesy, bathymetric mapping and hydro-oceanographic surveys.
Research, monitoring and other activities in the last three years
Assisting in the development of regulations and also in the detection and mapping of pollutants.
Major current research and other activities
Same as in the last three years
Cooperative programme
The Agency cooperates with relevant institutions of the region. It is also the national coordinating agency for surveys and mapping.

Institution structure
The agency is divided into four departments:
- Topographic base mapping
- Hydrographic and nautical charting
- Resources inventory and evaluation
- Administration

Staff
50 Professional staff 290 Technical staff 0 Other staff

Institution code: 000058 Information received: 05/09/84

Pusat Pengajian Sains Kimia, Universiti Sains Malaysia (USM)

(School of Chemical Sciences, University of Science, Malaysia)

Executive officer RAKIJAN Jamjan: Dean

Postal Address

Pusat Pengajian Sains Kimia, Universiti Sains Malaysia (USM)
MINDEN, PENANG

Telephone: 04-883822
Telex: MA 40254
Cable: UNISAINS

Working languages
Malay, English

Nature of institute
Governmental Academic

Main fields of activities
Chemical Sciences Pollution
Education, Training or Extension

Objectives and programmes
- Research on the chemical and physical properties of cement
- Electroplating and corrosion studies
- Determination of some minor unknown compounds in palm oil
- Water purification and epoxidation of natural rubber with an organic catalyst
- Project in assisting off-campus students
- Metal ions in palm oil
- A study of air pollution in Malaysia
- Study of the efficiency of waste stabilisation ponds
- Studies on Cyperaceal: Screening of juvenile hormone
- Preparation and usage of organic tin compounds
- An electrochemical study of tin
- Extraction of carotene
- Sintesis and application of tin compounds in agriculture
- Chemical analysis of the volatile substances derived from the grilling/frying of (a) belacan, (b) dried cuttlefish and (c) dried fish
- Surface properties and catalytic activities of tin oxide
- Study of the surface and certain physical properties of rubber
- Use of C-13 NMR in rubber research
- Chemistry of natural rubber
- Chemical analysis and utilization of effluent from palm oil processing mill
- Fractionation by density gradient
- Absorption of beta-carotene by bleaching earths
- Growth substances on oil palm and cocoa
- Organotin compounds research project
- Recovery and utilization of carotenes from palm oil
- Synthesis of a weed poison

Cooperative programme
- Palm Oil Research Institute of Malaysia (Chemistry and technology of palm oil)
- AGROMAC (growth substances on palm oil and cocoa)
- International Tin Research Institute (Organotin compounds)
- International Foundation for Science (Effluent from palm oil processing mills)

Training programme
- Undergraduate leading to the degrees of B.Sc. (Hons.) and B.Sc. (Ed.)(Hons)
- Postgraduate leading to the degree of M.Sc. and Ph.D.
- Glassblowing at the technician level
- Surface chemistry of wood
- Transport properties of polymer blends

Institution structure
The School is divided into 4 main sections:
- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry
- Analytical Chemistry

Staff
50 Professional staff 42 Technical staff 15 Other staff

Staff (Cont.)
Professional scientific staff:

Name	Degree	Speciality
Ahmad Md. Noor	M.Sc.(Lectr.)	Physical chemistry
Ainie Hj. Kuntom (Ms)	Ph.D.(Lectr.)	Organic chemistry
Ang Tian Tse	Ph.D.(Lectr.)	Physical chemistry
Baharuddin Saad	M.Sc.(Lectr.)	Analytical chemistry
Boey Peng Lim	Ph.D.(Lectr.)	Organic chemistry
Chio Hwi Tek	Ph.D.(Assoc. Prof.)	Physical chemistry, Inorganic chemistry
Feng Meow Chan	Ph.D.(Lectr.)	Organic chemistry
Hamzah Darus	Ph.D.(Lectr.)	Analytical chemistry
Jamil Ismail	Ph.D.(Lectr.)	Physical chemistry
Jamjan Rajikan	Ph.D.(Assoc. Prof.)	Physical chemistry
Kamarudin Hussin	M.Sc.(Lect.)	Physical chemistry
Khoo Lian Ee	Ph.D.(Lectr.)	Organic chemistry
Leong Wah Hing	Ph.D.(Assoc. Prof.)	Inorganic chemistry
Liew Kong Yong	Ph.D.(Lectr.)	Physical chemistry
Lim Choo Loh	Ph.D.(Lectr.)	Organic chemistry
Lim Poh Eng	Ph.D.(Lectr.)	Physical chemistry
Md. Sani Ibrahim	M.Sc.(Lectr.)	Organic chemistry
Md. Sariff Jab	Ph.D.(Lectr.)	Analytical chemistry
Mohd. Jain Noordin	Ph.D.(Lectr.)	Physical chemistry
Morsingh, F.	Ph.D.(Prof.)	Organic chemistry
Muhammad Idris Saleh	Ph.D.(Lectr.)	Analytical chemistry
Nair, N.K.	Ph.D.(Lectr.)	Physical chemistry
Nik Norma Nik Mahmood (Ms)	M.Sc.(Lectr.)	Organic chemistry
Norita Mohamad (Ms)	Ph.D.(Lectr.)	Analytical chemistry
Ong Kim Chye	Ph.D.(Lectr.)	Analytical chemistry
Oon Hiang Hock	Ph.D.(Lectr.)	Organic chemistry
Poh Bo Long	Ph.D.(Prof.)	Organic chemistry
Seng Chye Eng	Ph.D.(Lectr.)	Physical chemistry
Sulaiman Abdul Ghani	Ph.D.(Lectr.)	Analytical chemistry
Teo Soon Beng	Ph.D.(Lectr.)	Inorganic chemistry
Teoh Siang Guan	Ph.D.(Lectr.)	Inorganic chemistry
Tong Yook Chai	Ph.D.(Lectr.)	Organic chemistry
Wan Rosli Wan Daud	M.Sc.(Lectr.)	Physical chemistry
Wong Keng Chong	Ph.D.(Lectr.)	Organic chemistry
Zainal Abidin Ahmad	Ph.D.(Lectr.)	Physical chemistry
Zainudin Mat Said	Ph.D.(Lectr.)	Organic chemistry
Zuraidah Abdul Rahman (Ms)	M.Sc.(Lectr.)	Inorganic chemistry
Zakaria Mohd. Amin	Ph.D.(Lectr.)	Physical chemistry
Farook Adam	B.Sc.(Instr.)	General chemistry
Khairun Azizi (Ms)	B.Sc.(Instr.)	General chemistry
Kirupanithi Pooranavelu (Ms)	B.Sc.(Instr.)	General chemistry
Manoharan Veeran	B.Sc.(Instr.)	General chemistry
Mustaffa Ahmad	B.Sc.(Instr.)	General chemistry
Nordin Mohamad	B.Sc.(Instr.)	General chemistry
Sofiah Saidin (Ms)	B.Sc.(Instr.)	General chemistry
Wan Hafsah Wan Mohamad (Ms)	B.Sc.(Instr.)	General chemistry
Wee Kim Tho (Ms)	B.Sc.(Instr.)	General chemistry

Premises/facilities
Building area: 9192 m² Laboratory area: 5685 m²
With facilities for:
Visiting Scientists: 1 Students: 700

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 324950

Monographs and serials titles:
- School Handbook-Sessions 1981/82, 1982/83, 1983/84
- Annual Reports-Sessions 1978/79 and 1979/80, 1980/81 and 1981/82
- Research in the School of Chemical Sciences Sessions 1980/81, 1981/82

All School publications are in Malay

Equipment
Infra-red spectrophotometers, far infra-red spectrophotometer, ultra violet spectrophotometers, atomic absorption spectrophotometer, 60MHz and 100MHz nuclear magnetic resonance spectrometers, gas-liquid chromatography and high pressure liquid chromatography apparatus, polarimeter, Guoy balance, Laser Raman spectrophotometer, gas chromatograph-mass spectrometer, liquid nitrogen plant.

Institution code: 000061 Information received: 29/06/83

Jabatan Alam Sekitar, Kementerian Sains, Teknologi Dan Alam Sekitar (JAS)

(Department of Environment, Ministry of Science, Technology and Environment (DOE))

Executive officer THINAGARA SUNDRAM Sinniah: Director-General

Postal Address

Jabatan Alam Sekitar, Kementerian Sains,
Teknologi Dan Alam Sekitar (JAS)
1st Floor, Mui Plaza P. Ramlee Road,
KUALA LUMPUR 01-02, KUALA LUMPUR

Telephone: 420322-434-757
Cable: SEKITAR, KUALA LUMPUR

Working languages
Malay, English

Nature of institute
Governmental

Main fields of activities
Pollution
Education, Training or Extension
Computer / Information Systems

Areas of speciality

Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Inland (Fresh) Waters
Mangroves Ecosystems	Coral Ecosystems
Petroleum Hydrocarbons	Metals
Halogenated Hydrocarbons	Pathogenic Micro-organisms
Nutrients	Radionuclides

Objectives and programmes

History of institution, its mandate and purpose

The Division of Environment (now Department of Environment) under the Ministry of Science, Technology and Environment was established in April 1975 when the Environmental Quality Act 1974 was brought into force. The Environmental Quality Act 1974 gives the Department of Environment the mandate to accomplish national goals in environmental protection. It seeks nothing less than improving the quality of life of the people and has as its main objective the prevention, abatement, control of pollution and enhancement of the quality of the environment.

Research, monitoring and other activities in the last three years

In accordance with the above strategy, pollution control has been the punch-line activity and efforts of the Dept. of Environment. These were concentrated on the development of administrative procedures and regulations for pollution control. The oil palm and rubber industries were identified to be the most chronic sources of water pollution and priority was given to the control of pollution from these sources. The two important regulations namely, Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, and Environmental Quality (Prescribed Premises)(Raw Natural Rubber) Regulations were enforced on 1.7.1978 and 1.4.1979 respectively. About 183 palm oil mills and 217 rubber factories throughout Malaysia have been brought under control under these Regulations. Three other Regulations, namely, Environmental Quality (Sewage and Industrial Effluents) Regulations 1979, and Motor Vehicles (Control of Smoke and Gas Emission) Rules 1977, have been enforced to alleviate these problems. Another set of Regulations directed at control of noise pollution is being developed. Another area of environmental concern which has been given immediate attention is marine pollution where a National Contingency Plan for the mitigation and control of oil spills has been developed in cooperation with Marine Department and other related agencies. Also regulations to control marine pollution due to discharges from ships and dumpings into the seas are currently being developed. The other major activities in the pollution control programme are:

- Baseline studies and monitoring of water and air quality including marine environment
- Investigation of complaints
- Development of water and air quality criteria and standards
- Protection of groundwater and soil environment
- Compilation of source inventory
- Presiting evaluation of new industrial sources and licensing
- Review of regulations, effluent and emission standards
- Initiation and co-ordination of research on pollution control technology
- Documentation of control technology and other information
- Data processing
- Co-ordination of the National Contingency Plan to combat oil spills

The Department of Environment is also participating in the imple-

Objectives and programmes (Cont.)

mentation of the Action Plan for the Protection of the Marine Environment and Coastal Waters of the East Asian Region under the United Nations Environment Programme (UNEP) Regional Seas Programme

Major current research and other activities

The Department of Environment has been involved in a coordinating catalytic role in promoting the development of treatment technology. Currently, research is being carried out on the development of treatment technology for piggery waste which has reached pilot plant operation stage. This project is being carried out jointly with Standards and Industrial Research Institute of Malaysia (SIRIM), the Department of Environmental Studies of Universiti Pertanian Malaysia (UPM) and the Department of Veterinary Services, Malaysia.

Future programmes

With the launching of the Fourth Malaysia Plan, the Department of Environment has moved into the area of environmental planning with initial efforts focussed on land-use planning and industrial location. Future programmes essentially will be based on a preventive approach in dealing with the environmental problems particularly those arising from the development of land and natural resources. Basically, the most effective method of controlling environmental problems lies in the advance or forward planning in environmentally-related activities in terms of long-term conservation of environmental assets. To this end, it is necessary to ensure that imperatives of environmental protection are integrated into development projects to avoid environmental degradation and costly time-consuming remedial measures. In the discharge of this responsibility, the Environment Department has developed guidelines on:

- the control and prevention of erosion and siltation
- the siting and zoning of industries
- environmental impact assessment
- the selection and management of sites for the disposal of solid and hazardous wastes.

These guidelines are intended to help the State Governments and other Government Agencies to incorporate environmental factors into their development planning. A number of potentially polluting industries and projects under the Fourth Malaysia Plan will be required to have environmental impact assessments done in order that the various environmental and ecological impacts can be foreseen and pinpointed and effective steps can be taken in advance to take account of and mitigate their environmental consequences. In addition to proper environmental planning, the Department of Environment is active in the area of environmental education with a view to developing new perceptions and awareness at all levels in society towards the environment. For the purpose of carrying out the above tasks efficiently, three new functional units, namely, Environmental Impact Assessment Unit and Education and Information Unit and Resource Management Monitoring Unit have been established within the Department of Environment.

Cooperative programme

The Department of Environment collaborates with different government agencies such as:

- Drainage and Irrigation Department
- Department of Meteorological Services
- Fishery Department

and other environment-related agencies. Co-ordinates research in respect of treatment technology such as for palm oil mill effluent and piggery waste. Further it takes part in GEMS programme with respect to air and water quality monitoring.

Training programme

Attachment to Environmental Protection agencies in developed countries, to universities and other institutes providing courses

Institution structure

The Department is divided into 6 functional units as follows:

- Administration and Coordination
- Water Pollution Control
- Air Pollution Control
- Environmental Impact Assessment
- Environmental Education and Information
- Resources Management Monitoring

Staff

67 Professional staff 132 Technical staff 177 Other staff

Professional scientific staff:

Name	Degree	Speciality
S.T. Sundram	M.A.	Development economics
A. Maheswaran	B.Sc.(Hons)	Chemistry
Goh Kiam Seng	B.Eng.	Civil engineering
Abu Bakar Jaafar	Ph.D.	Environmental science

Staff (Cont.)

Name	Degree	Speciality
Godwin Singam	B.E.(Hons)	Chemical engineering
Tan Meng Leng	B.Eng.Hons.	Mechanical engineering
Ho Yueh Chuen	M.Sc.	Applied microbiology, Environmental technology
Soo Ah Kan	M.Sc.	Ecology, Environmental management
Tan Hock Chuan	B.Sc.	Biochemistry
Abdul Aziz bin Abdul Rasol	B.E.(Hons)	Chemical engineering
Rosnani bte Ibarahim	B.Sc.(Hons)	Chemical engineering
Norhayati Mustapha	M.Sc.	Environmental engineering
Hasmah Harun	B.Sc.(Hons)	Environmental science
Hashim Daud	B.Sc.(Hona)	Microbiology
Lee Choong Min	B.E.(Hons)	Mechanical engineering
Wong Foon Meng	B.E.(Hons)	Mechanical engineering
Shamsuddin b. Hj. Latiff	B.Sc.(Hon)	Chemical engineering
Lee Heng Keng	B.E.(Hons)	Mechanical engineering
Mohd. Ishak Thani	B.E.(Hons)	Chemical engineering
Nooralshurudin b. Md. Salleh	B.Sc.	Environmental science
Hor Yin Heng	B.Sc.	Environmental science
Choong Mei Chun	B.Sc.	Environmental science
Tengku Bakry Shah T. Johan	B.Sc.(Hons)	Chemistry
Halimah Hassan	B.Sc.(Hons)	Ecology
Ab. Rahman Awang	B.Sc.	Chemical technology
Abu Hassan Mohd. Isa	B.Sc.(Hons)	Applied science (Electronics)
Rahani Hussein	B.Sc.	Chemistry
Choy Chee Keong	B.Sc.	Environmental science
Mohamad Sayuti bin Sapeai	B.Sc.(Hons)	Physics
Mohd. Subki bin Abd. Hamid	Adv.Dip.	Mechanical engineering
Rahmah Md. Tahir	M.A.	Biological science
Wan Ramlah Hj. Wan Ibrahim	B.Sc.	Science and the environment
Omar b. Mohd. Zain	B.Sc.	Environmental science
Zainal b. Abdullah	B.Sc.(Hons)	Biochemistry
Kalsom bte Abd. Ghani	B.Sc.(Hons)	Applied chemistry, Control engineering
Mohd. Jaafar	B.Sc.(Hon)	Environmental science
Mohd. Izzudin Abdul Ghani	B.Sc.	Environmental science
Abd. Rahim bin Md. Shahid	B.Sc.	Agriculture engineering
Sittee Razillah bte Hassan	B.Sc.(Hons)	Botany
Zulkifli Abd. Rahman	B.Sc.	Environmental science
Hassan bin Mat	B.Sc.(Hons)	Chemical engineering
Charanpal Singh	B.Sc.(Hons)	Chemical engineering
Mohd. Kamarulnajuid Horahim	B.Sc.	Agriculture engineering
Pauziah Hanum bte Abd. Ghani	B.Sc.	Environmental science
Y.M. Raja Rokiah Raja Saigon	B.Sc.	Environmental science
Zubaidah bte Abdullah	B.Sc.	Ecology
Abd. Razak bin Abd. Manap	B.Eng.(Hons)	Agriculture engineering
Maxlien anak Gombek	B.E.(Chem)	Chemical engineering
Ruslan Haji Mohamed	B.Sc.	Agriculture engineering
Kamalakaran a/l Nadason	B.Sc.(Chem)	Chemical engineering
Maraiana Mohd. Nor	B.Sc.(Chem)	Chemical engineering
Rusli Che Hussin	B.Sc.	Environmental science
Ibrahim Majid	B.Sc.	Environmental science

Premises/facilities
Building area: 1505 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 2404
Number of periodical subscriptions:10

Monographs and serials titles:
- Annual Report 79 (In English)
- Quarterly Magazine 'Sekitar' (In English and Malay)
- Booklet on 'Alam Sekitar Kita' (Our Environment, in Malay)
- Booklet on 'Pemuliharaan Alam Sekitar' (Environmental Conservation, in Malay)

Equipment
10 dissolved oxygen meters, 7 SCT meters, 15 pH meters, 2 microscopes, gas chromatograph, 5 Secchi discs, 2 Ruttner samplers, 4 tug boats, 6 barges.

Research craft

Name: LANG RAJAWALI
Owner: DOE
Length: 32 m.
Type: Patrol craft
Date of construction: 1983
Crew: 14
Special facilities:
Satellite navigational equipment. Telecommunication equipment.

Name: LANG TIRAM
Owner: DOE
Length: 48 m.
Type: Work boat
Date of construction: 1979
Crew: 16
Special facilities:
Fire-fighting equipment. Oil dispersant tank.

Name: LANG SIPUT
Owner: DOE
Length: 48 m.
Type: Work boat
Date of construction: 1979
Crew: 16
Special facilities:
Oil Skimmer (Cyclonet 100), Mechanical oil recovery, boom housing, telecommunication equipment.

Institution code: 000062 Information received: 19/10/83

Jabatan Kimia Malaysia (JK)

(Department of Chemistry, Malaysia)

Executive officer AMARASINGHAM R.D.: Director-General

Postal Address

Jabatan Kimia Malaysia (JK)
Jalan Sultan
PETALING JAYA, SELANGOR

Telephone: 569522

Working languages
Bahasa Malaysia, English

Nature of institute
Governmental

Main fields of activities
Chemical Sciences
Microbiology
Pollution

Areas of speciality
Offshore Marine Waters
Coastal Marine Waters
Brackish Waters
Petroleum Hydrocarbons
Metals
Halogenated Hydrocarbons
Pathogenic Micro-organisms
Nutrients

Objectives and programmes

History of institution, its mandate and purpose

The Department was established before the World War II and is at present with the Ministry of Science, Technology and Environment. It is a service-oriented organization and has a network of seven branches spread all over the country. Its activities cover a wide range from forensic science, public health to waste treatment and disposal and other problems of environmental pollution. The Department carries out analytical work for several government agencies including the Division of Environment in the Ministry of Science, Technology and Environment.

Research, monitoring and other activities in the last three years

Laboratory scale study on treatment of crude palm oil effluent by anaerobic digestion and algae oxidation. This was followed by a pilot plant scale study on this method of treatment.

Major current research and other activities

Nationwide water quality monitoring (marine as well as inland waters) programme, source surveys, oil spill identifications, base-line studies, enforcement of environmental regulations, nationwide air quality monitoring, and a number of localised environmental projects. The laboratory services provided are mainly in the form of chemical analysis, biological and bacteriological examinations.

Future programmes

This department will be participating in the UNEP Regional Seas Programme.

Cooperative programme

The Department collaborates with different Government agencies such as:

- Division of Environment; Drainage and Irrigation Department; Department of Meteorological Services; Forestry Department.

Furthermore it takes part in:

- GEMS Water Programme
- WMO Air Quality Baseline Study Programme

Training programme

Attachment course to University and College students.

Institution structure

The Department of Chemistry has six functional divisions, one of which is the Pollution Division. The Pollution Division is divided into the following sections:

- Water Pollution Analysis Laboratory I
- Water Pollution Analysis Laboratory II
- Trace Metals Analysis Laboratory
- Gas Chromatograph/Pesticide Residue Analysis Laboratory
- Air Pollution and Industrial Hygiene Analysis Laboratory

Staff

9 Professional staff 23 Technical staff 0 Other staff

Professional scientific staff:

Name	Degree	Speciality
R.D. Amarasingham	M.Sc. C.Chem	Director-General
Harcharan Singh Tara	M.Sc.	Deputy Director General
Chee Ong Koh	B.Sc.Hons.	Director (Pollution Division)
Lim Poh Choo	B.Sc.Hons.	Chemist

Staff (Cont.)

Name	Degree	Speciality
Sharif Jumari	B.Sc.Hons.	Chemist
Sim Ah Bah	B.Sc.Hons.	Zoologist

Premises/facilities
Building area: 600 m² Laboratory area: 600 m²
With facilities for:
Students: 2

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1361
Number of periodical subscriptions:30

Monographs and serials titles:
- Annual Reports (the most recent being the 1980 issue)

Equipment
Gas chromatograph/mass spectrometer/data system, 2 gas chromatographs, 3 atomic absorption spectrophotometers, total organic carbon analyser, auto analyser, 2 infrared spectrophotometers, 2 Vis-UV spectrophotometers, 3 microscopes.

Institution code: 000063 Information received: 29/06/83

Pusat Pengajian Sains Kajihayat,
Universiti Sains Malaysia

(School of Biological Sciences,
University of Science, Malaysia)

Executive officer KECHIK, Ishak T.: Acting Dean

Postal Address

Pusat Pengajian Sains Kajihayat,
University Sains Malaysia
MINDEN - PENANG

Telephone: 883822
Telex: MA 40254 USMLIB
Cable: UNISAINS

Working languages
Malay, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Aquaculture
Chemical Sciences
Microbiology
Ecological Sciences
Oceanography
Physical Sciences
Pollution

Areas of speciality
Demersal Fish
Algae
Plankton
Brackish Waters
Petroleum Hydrocarbons
Halogenated Hydrocarbons
Other Invertebrates
Micro-organisms
Coastal Marine Waters
Mangroves Ecosystems
Metals
Nutrients

Objectives and programmes

History of institution, its mandate and purpose

The School was established in 1969, as one of the five schools of the University and is under the Ministry of Education, Government of Malaysia. The main objectives of the School are undergraduate and postgraduate teaching and research.

Research, monitoring and other activities in the last three years

In the past the School has carried out a number of studies such as hydrobiological survey on the entire west coast of North Malaysia bordering the Straits of Malacca; a survey on oil pollution and hydrographic studies in the coastal waters of the state of Sabah in East Malaysia as well as monitoring of pollution in the waters around the island of Penang. Many of these were basic studies involving chemical and biological analysis.

Major current research and other activities

- Aquatic Biology:
  Biology and fishery of local food fishes; distribution of marine and estuarine plankton; plankton production and food chain; pollution in coastal waters and estuaries (Chua, Dr. Thia Eng)
  Eutrophication of lotic waters, and aquatic weed pollution (Ho Sinn Chye)
  Limnological studies of reservoirs and fish ponds. Cultivation of fish in floating cages. Toxicity of oil and dispersant on fish (Lai, Dr. Hoi Chaw)
  Physico-chemical and biological studies of a meromictic lagoon. Ecology of mangroves. Environmental conservation - biology of coastal habitats and metals in some marine invertebrates (Ong, Dr. Jin Eong)
  Variation in the alginic acid in *Sargassum* sp. with seasons, reproductive state and growth rate and algal zonation in Penang Island (De Silva, Dr. M.W.R.N.)
  Comparative reproductive physiology of Malaysian fishes with emphasis on the maturation and induced spawning. Studies on fish populations to develop model for fisheries management (Khoo, Dr. Khay Huat)
  Controlled breeding of paddy-field fishes and some riverine cyprinids. Development and use of radioimmunoassays in reproductive research. Food and feeding requirements of larvae of some Malaysian teleosts (Eddy, Dr. S.P. Tan)
  Physiological ecology of mangrove invertebrates. Osmotic physiology of marine and freshwater crustaceans (Wong, Dr. Tat Meng)
  Ecology of intertidal invertebrates (Chambers, Dr. M.R.)
- Biochemistry:
  Algal zonation patterns, algal steroidal components of pharmaceutical importance, and factors leading to algal miniaturization in Pulai Pinang. Palm oil sludge and sugar refinery discharges and heavy metal pollution of the aquatic environment (Sivalingam, Dr. P.M.)

Objectives and programmes (Cont.)

- **Entomology:**
  Environmental degradation of insecticides. Residues of chlorinated hydrocarbons and environmental pollution (Gill, Dr. Sarjeet S.)
  Distribution and population fluctuation of mosquitoes in Pulau Pinang and interaction of environmental pollutants (Yap, Dr. Han Heng)
- Microbiology:
  Microbiology of sea foods: Isolation of efficient hydrocarbon utilizers from marine sources (Sidhu, H.S.)

Future programmes

The School has at the moment a number of academic staff involved in the field of aquatic biology, who carry out research work jointly or independently on problem oriented projects in relation to the national developmental programmes. With the establishment of the biological and marine field stations at Muka Head, the School will accelerate its research programmes in the area of marine sciences in the years ahead.

Cooperative programme

The School is collaborating with the School of Physics of the same University in studies on oceanography. It also works closely with the Fisheries Research Institute in Penang.

Training programme

Teaching programmes both at the undergraduate and the postgraduate level leading to the degrees of B.Sc., M.Sc. and Ph.D.

- Undergraduate level (optional courses in aquatic biology)
- For M.Sc. and Ph.D. (students carry out independent research in many areas of aquatic biology, particularly in the fields of fisheries and marine biology)

Adequate space and facilities available.

Institution structure

The School of Biological Sciences has five areas of activities in teaching and research. One of those is Aquatic Biology which includes fields such as Fisheries Biology, Freshwater Biology and Oceanography.

Staff

40 Professional staff 0 Technical staff 0 Other staff

Professional scientific staff:

Name	Degree	Speciality
Wong Tat Meng	Dr.	Ecology of crustaceans
Ramachandran C.P.		Parasitology
Ong Jin Eong		Marine biology
Chua Thia Eng		Fisheries biology
Yap Han Heng		Entomology (insecticide)
Lai Hoi Chaw		Limnology
Gill Sarjeet S.		Pesticides/insecticides
Chambers, M.R.		Ecology of invertebrates
Tan Eddy S.T.		Fish reproductive physiology
Sivalingam, P.N.		Biochemistry
De Silva, M.W.R.N.		Aquatic biology
Ho Sinn Chye		Water chemistry
Sidhu, H.S.		Microbiology
Khoo Khay Huat		Fish management, Reproductive physiology
Lim, P.E.		Fishery biology
Kechik, Ishak T.		Acting Dean
Leong, T.S.		Fishery biology
Wong, S.Y.		Parasitology
Teo, Christopher K.H.		Botany
Dhanarajan, G.		Botany
Lim, W.C.		Microbiology
Gong, W.K.		Marine biology
Liang, T.O.		Marine biology
Caunter, I.G.		Marine biology
Newmann, H.		Marine biology

Equipment

Spectrophotometers, electron microscope, scintillation counters. The School is well equipped to carry out most of the studies on marine science.

Institution code: 000064 Information received: 01/09/81

Jabatanarah Haidrografi, Departmen Tentera Laut, Kementerian Pertahanan

(Directorate of Hydrography, Department of Navy, Ministry of Defence)

Executive officer GOH Siew Chong: Director

Postal Address

Jabatanarah Haidrografi, Departmen Tentera Laut,
Kementerian Pertahanan
Jalan Padang Tembak
KUALA LUMPUR 15-03

Telephone: 03-9603075/921333
Telex: MA 30289 (PREFIX: FOR NAVY)
Cable: KEMENTAH KUALA LUMPUR (IN TEXT: FOR NAVY)

Working languages
Malay, English

Nature of institute
Governmental

Main fields of activities
Oceanography

Areas of speciality
Tide / Waves
Coastal Marine Waters
Offshore Marine Waters

Objectives and programmes
History of institution, its mandate and purpose
Established in 1969. National authority for hydrographic surveying in the country since October 1972. Hydrographic surveys for navigational chart production.
Research, monitoring and other activities in the last three years
Hydrographic surveys and oceanography.
Major current research and other activities
Same as in the last three years
Future programmes
Hydrographic surveys and oceanography and chart production.
Cooperative programme
Joint hydrographic surveys with neighbouring countries.
Training programme
Training for own technicians in hydrographic surveying.

Institution structure
The Hydrographic Service is part of the Royal Malaysian Navy under the Ministry of Defence.

Staff
32 Professional staff 207 Technical staff 0 Other staff

Premises/facilities
Building area: 300 m²

Equipment
Equipment as listed below for survey ships.

Research craft

Name:	KD MUTIARA
Length:	71 m.
Type:	Vessel
Date of construction:	1977
Crew:	156
Lab. space:	20 m2

Special facilities:
Satnav and electronic position fixing systems, deep and shallow echo sounders, electronic data processing, oceanographic and bathy-winches, gravity corer, temperature, salinity, sound velocity and depth probe, side scan sonar, doppler and EM log, four sounding boats and 6 workboats.

Name:	KD PERANTAU
Length:	46 m.
Type:	Vessel
Date of construction:	1969
Crew:	46000

Special facilities:
Electronic position fixing system, echo sounders, 2 survey boats.

Institution code: 000065 Information received: 14/06/83

Jabatan Zoologi, Universiti Malaya

(Department of Zoology, University of Malaya)

Executive officer FURTADO J.I.: Professor

Postal Address

Jabatan Zoologi, Universiti Malaya
Lembah Pantai
KUALA LUMPUR 22-11

Telephone: 555466
Telex: MA 37453
Cable: UNIVSEL

Working languages
Malay, English

Nature of institute
Academic

Main fields of activities

Biological Sciences	Ecological Sciences
Inland Fisheries	Aquaculture
Chemical Sciences	Pollution

Areas of speciality

Demersal Fish	Shrimps / Prawns
Other Invertebrates	Coastal Marine Waters
Brackish Waters	Inland (Fresh) Waters
Mangroves Ecosystems	

Objectives and programmes

History of institution, its mandate and purpose

The Department was established in 1957. Since 1966, it has been responsible for an ecology degree programme. The Department was the focal point for terrestrial and aquatic ecological research under the auspices of the International Biological Programme (IBP), and continues to serve as such for UNESCO's Man and Biosphere (MAB) and marine sciences programmes. The main objectives of the Department are to teach zoology and ecology, to train students at the tertiary and quarternary levels, and to develop a centre of academic excellence in zoology and ecology especially concerning the South East Asian region.

Research, monitoring and other activities in the last three years

The Department has accomplished research activities dealing with terrestrial and aquatic ecology with local and international funding:

- Secondary productivity in mangroves (with funding from MAB-UNESCO)
- Nutrient dynamics in mangrove creek (with funding from University of Rhode Island)
- Penaeid shrimp fisheries in mangrove/coastal waters
- Coastal zone management (funded by ADC)
- Energetics of sandy shore invertebrates communities
- Aquatic bioindicators of land use and pollution, including fouling organisms.
- Multispecies stock assessment in reservoir fisheries (with assistance from ICLARM)
- Conservation and management of swamp rivers and estuaries

Major current research and other activities

- Ecological energetics of marine invertebrates (Chong, E.L.)
- Coastal zone management (J.I. Furtado)
- Multispecies stock assessment (S.Y. Yap and J.I. Furtado)
- Fish biology (M.I. Zakaria)
- Pollution biology (A.H. Sulaiman)
- Fish parasitology (L.H. Lim)

Future programmes

Continuation of current programme

Cooperative programme

The Department is cooperating actively in research with UNESCO, the Norwegian Academy of Sciences and Letters, the University of Rhode Island, the International Centre for Living Aquatic Resources Management (ICLARM) and the United Nations University besides major institutions within the country.

Training programme

- B.Sc. (Zoology, Ecology - with Aquatic Ecology as an option)
- M.Sc. and Ph.D. (by thesis)

The Department is recognized as a centre for postgraduate and doctorial studies and has participated in a regional post-graduate courses and training programmes in quantitative ecology and mangrove ecology.

Institution structure
The Department has the following functional and teaching units:
- Aquatic Ecology
- Animal Physiology
- Entomology
- Lower Invertebrate Zoology
- Vertebrate Zoology
- Terrestrial Ecology

and a Field Studies Centre concerned with rainforest ecology

Staff
20 Professional staff 30 Technical staff 4 Other staff

Professional scientific staff:

Name	Degree	Speciality
Furtado, J.I.	Ph.D.	Hydrobiology, Ethology, Tropical ecology
Lim, R.P.	Ph.D.	Limnology Rice-field ecology
Sasekumar, A.	Ph.D.	Marine biology
Chong, V.C.	M.Sc.	Marine biology
Yap, S.Y.	Ph.D.	Reservoir fisheries
Lim, L.H.	M.Sc.	Fish parasitology
Sulaiman, Abdul Halim	M.Sc.	Pollution biology
Zakaria, M.I.	M.Sc.	Fish biology
Chong, E.L.	M.Sc.	Ecological energetics

Premises/facilities
Building area: 300 m²

Information facilities
Library holdings:
Number of periodical subscriptions:20

Monographs and serials titles:
- Malaysian Journal of Science (published by Faculty of Science)
- Wallaceana (global newsletter for tropical ecology, published by the University of Malaya and the International Society for Tropical Ecology)

Equipment
Spectrophotometer (UV-VIS + IR), atomic absorption spectrophotometer, optical salinometer, reversing water bottle, STD system, CTD system and gas-liquid chromatograph.

Aquarium facilities
Total area: 300 m² Number of tanks: 10

Organisms maintained:
Crustaceans

Species maintained for experimental purposes:

Macrobrachium rosenbergii *Penaeus merguiensis* *Penaeus indicus*

Institution code: 000066 Information received: 14/07/83

Jabatan Kimia, Universiti Malaya (U.M.)

(Department of Chemistry, University of Malaya (U.M.))

Executive officer CHAN Kai Cheong: Head

Postal Address

Jabatan Kimia, Universiti Malaya (U.M.)
Lembah Pantai
KUALA LUMPUR 01-02

Telephone: 555466
Telex: MA 37453
Cable: UNIVSEL

Working languages
Malay, English

Nature of institute
Governmental

Main fields of activities
Chemical Sciences
Education, Training or Extension

Areas of speciality
Metals
Nutrients

Objectives and programmes
History of institution, its mandate and purpose
The Department of Chemistry in the University of Malaya was set up in 1962 in the present campus in Kuala Lumpur. This Department is now one of the largest in the University of Malaya occupying two wings of the Faculty of Science. The fundamental objective of the Department is to provide education in chemistry and to develop to the full the potential of each student in general education and subsequent career. The Department also strives to promote and encourage research in chemistry.
Major current research and other activities
Natural products; polymerisation; organometallics particularly tin; surface and colloid; fundamental studies in reaction mechanism; environmental chemistry; trace metals and nutrients in the water environment; environmental monitoring, electrochemistry etc.
Cooperative programme
Joint work with: I.P.T. (Institute of Higher Studies) on organotin chemistry (Professor V.G. Kumar Das, Dr. Chu Chit Kay, Dr. Chen Wei Dr. H.T. Toh, etc.)
Training programme
- Facilities for undergraduate studies in all branches
- Research work leading to M.Sc. and Ph.D.

Institution structure
The Department is divided in 3 branches:
- Inorganic
- Organic
- Physical

Staff

Professional scientific staff:

Name	Degree	Speciality
Chan Kai Cheong	Ph.D.	Natural products
Ng Soon	Ph.D.	Spectroscopy
Kumar Das, V.G.	Ph.D.	Organometallics
Lee, K.H.	Ph.D.	Spectroscopy
Sambhi, M.S.	Ph.D.	Natural rubber
Khoo, K.H.	Ph.D.	Electrochemistry
Lim, T.K.	Ph.D.	Theoretical chemistry
Burfield, D.R.	Ph.D.	Polymer chemistry
Goh, S.H.	Ph.D.	Palm oil chemistry
Goh, L.Y.	Ph.D.	Inorganic chemistry
Loke, S.E.	Ph.D.	Chemical education
Lim, Y.Y.	Ph.D.	Spectroscopic studies, Inorganic compounds
Chan, C.Y.	Ph.D.	Electrochemistry
Smithers, R.H.	Ph.D.	Organic reaction mechanism
Lim, M.C.	Ph.D.	Physical inorganic chemistry
Othman bin Mohd. Nor	M.Sc.	Inorganic mechanisms
Tong, S.L.	Ph.D.	Analytical chemistry
Ho, C.C.	Ph.D.	Colloid chemistry
Chee, K.K.	Ph.D.	Polymer chemistry
Koh, S.P.	Ph.D.	Chemical education
Wong, W.H.	Ph.D.	Organic synthesis
Toh, H.T.	Ph.D.	Natural products
Ng, W.L.	Ph.D.	Surface chemistry

Staff (Cont.)

Name	Degree	Speciality
Chu, C.K.	Ph.D.	Organometallics
Ng, S.C.	Ph.D.	Polymer chemistry
Gan, L.H.	Ph.D.	Physical chemistry
Tioh, N.H.	Ph.D.	Environmental analysis
Chen Wei	Ph.D.	X-ray crystallography
Khoo, S.K.	Ph.D.	Liquid crystals
Tan, G.H.	Ph.D.	Gas-liquid chromatography
Kam, T.S.	Ph.D.	Organic reaction mechanism
A. Hamid bin A. Hadi	Ph.D.	Phytochemistry
A. Hamid bin Yahaya	Ph.D.	Surface properties
Kamaliah bte Hj. Mahmood	Ph.D.	Natural products chemistry
Khatijah bte Jumangat	Ph.D.	Polymer chemistry
Mohd. Radzi bin Abas	Ph.D.	Analytical chemistry, Environmental chemistry
Zainuddin bin Ariffin	Ph.D.	Inorganic chemistry (X-ray, Mossbauer)

Equipment
Mass spectrophotometer, gas liquid chromatograph, ESR, NMR, polarograph, atomic absoption spectrophotometer, spectrophotometer (UV - VIS and IR).

Institution code: 000067 Information received: 24/06/83

Fakulti Perikanan dan Sains Samudra,
Universiti Pertanian Malaysia (FPSS UPM)

(Faculty of Fisheries and Marine Science,
University of Agriculture Malaysia)

Executive officer HAJI MOHAMED, Mohd. Ibrahim B.: Dean

Postal Address

Fakulti Perikanan dan Sains Samudra,
Universiti Pertanian Malaysia (FPSS UPM)
Fakulti Perikanan dan Sains Samudra, UPM
SERDANG, SELANGOR

Telephone: 356101-110
Telex: UNIPER MA 37454
Cable: UNIPERTAMA SERDANG

Working languages
Malay, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Marine Fisheries
Resources Management
Aquaculture
Limnology
Microbiology
Engineering
Policy and Planning
Ecological Sciences
Inland Fisheries
Fishing Technology
Oceanography
Chemical Sciences
Pollution
Meteorology / Climatology
Education, Training or Extension

Areas of speciality
Demersal Fish
Other Vertebrates
Shrimps / Prawns
Algae
Plankton
Offshore Marine Waters
Brackish Waters
Mangroves Ecosystems
Petroleum Hydrocarbons
Halogenated Hydrocarbons
Nutrients
Pelagic Fish
Cephalopods
Other Invertebrates
Micro-organisms
Benthos
Coastal Marine Waters
Inland (Fresh) Waters
Coral Ecosystems
Metals
Pathogenic Micro-organisms

Objectives and programmes
History of institution, its mandate and purpose
Established as a division in 1974. Began to offer diploma in fisheries program. Elevated to faculty status in 1979.
Research, monitoring and other activities in the last three years
Research on:
- Prawns and fish breeding, nutrition and diseases
- Domestic sewage, heavy metals and hydrocarbons pollution in rivers and estuaries
- Coral reefs ecology and mapping environmental sensitive areas,
- Fishing gear designs

Major current research and other activities
Same as in the last three years
Future programmes
Same as in the last three years
- and will also focus on the intensive culture of food fish (freshwater and marine)

Cooperative programme
- International Development Research Center, Canada (fish parasites and fish nutrition)
- IFS (Cage culture)
- FAO (Rice-cum-fish culture)
- Sea grant (Fishing technology)

Training programme
- Diploma in fisheries program
- Bachelor of Science (Fisheries program)
- Graduate and post graduate level courses leading to M.Sc. and Ph.D.
- Short term vocational courses for fisheries, fish farmers and extension officers

Institution structure
The Faculty has the following departments:
- Fish Biology and Aquaculture
- Fishing Technology
- Fisheries and Marine Science Center (Trengganu)

Staff
30 Professional staff 42 Technical staff 20 Other staff

Professional scientific staff:

Name	Degree	Speciality
Capt. Mohd. Ibrahim Hj. M.	M.MA	Fishing gear technology
Law Ah Theem	Ph.D.	Aquatic chemistry
A.K.M. Mohsin	Ph.D.	Fisheries biology
Chan Hooi Har	Ph.D.	Fish physiology, Invertebrate physiology
Ang Kok Jee	Ph.D.	Aquaculture
M.W.R.N. De Silva	Ph.D.	Marine ecology
Mohd. Azmi Ambak	M.Sc.	Resource management
Ridzwan Ab. Rahman	M.Sc.	Marine biology
Shariff Mohd. Din	M.Sc.	Fish diseases
Che Roos Saad	M.Sc.	Fish nutrition
Sharr Azni Harmin	M.Sc.	Fish breeding
Siti Khalijah Daud	M.Sc.	Fish biology
Cheah Sin Hock	M.Sc.	Hatchery and nursery
Aizam Zainal Abidin	M.Sc.	Reproductive biology
Hj. Umar Salleh	M.Sc.	Mariculture
Mohd. Zaki Mohd. Said	M.Sc.	Marine biology
Phillip Arumagam	M.Sc.	Aquatic ecology
Chan Eng Heng	M.Sc.	Fisheries biology
Liew Hock Chark	M.Sc.	Marine zooplankton
Mustafa Kamal Abd. Satar	M.Sc.	Pond management
Fatimah Md. Yusof	M.Sc.	Limnology
Siti Shapor Hj. Siraj	M.Sc.	Fish genetics
Mohamad Isa Mansor	M.Sc.	Marine engineering
Lokman Shamsudin	M.Sc.	Marine parasitology
Juhari Hussein	M.Sc.	Naval architecture, Marine engineering
Zainal Ashirin Shahardin	M.Sc.	Fishing gear technology
Maidin Hamid	M.Sc.	Fishing gear technology

Premises/facilities
Building area: 11640 m² Laboratory area: 2400 m²
With facilities for:
Visiting Scientists: 4 Students: 250

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1000000
Number of periodical subscriptions: 100

Monographs and serials titles:
Scientific Journal-Pertanika (published by the University)

Equipment
Atomic absorption spectrophotometer, gas chromatographs, flame spectrophotometer, UV-visible spectrophotometer, pH meter, salinometers, oxygen meters, current meters, samplers, microscopes, (different types), adiabatic bomb calorimeter, fish nutrition equipment, fish disease equipment, complete diving equipment with compressor, analytical balances, centrifuges, photographic equipment, echosounder, tensile testing machine and specific ion meter.

Aquarium facilities
Total area: 400 m² Number of tanks: 70

Organisms maintained:
Other Vertebrates Crustaceans Other Invertebrates
Algae Micro-organisms

Species maintained for experimental purposes:

Hampala macrolepidota *Macrobrachium rosenbergii* *Leptobarbus hoevenii*
Ctenopharynodon idella *Osteochilus hasselti* *Cyprinus carpio*
Osphronemus gouramy *Pangasius sutchi* *Macrobrachium lanchestrii*
Puntius gonionotus *Mystas nemurus* *Clarias macrocephalus*

Research craft

Name: UNIPERTAMA I
Owner: FPSS/UPM
Length: 5 m.
Type: Inshore fishing boat
Date of construction: 1980
Crew: 2
Scientists: 15
Special facilities:
Winches and some movable oceanographic equipment. Used mostly for coastal work and training.

Name: UNIPERTAMA II
Owner: FPSS/UPM
Length: 25 m.
Type: Trawler
Date of construction: 1982
Crew: 11
Scientists: 10
Lab. space: 4 m2
Special facilities:
Navigational and meteorological equipment, echo sounders, net sounder, winches and oceanographic equipment.

Institution code: 000068 Information received: 28/06/83

Stesen Luar Kajihayat Muka Head,
Pusat Pengajian Sains Kajihayat,
Universiti Sains Malaysia (SLKMH)

(Muka Head Biological Field Station,
School of Biological Sciences,
University of Science, Malaysia (MHBFS))

Executive officer KECHIK, Ishak T.: Director

Postal Address

Stesen Luar Kajihayat Muka Head,
Pusat Pengajian Sains Kajihayat,
Universiti Sains Malaysia (SLKMH)
PENANG

Telephone: 883822
Telex: MA 40254 USMLIB
Cable: UNISAINS

Working languages
Malay, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Marine Fisheries
Inland Fisheries
Aquaculture
Education, Training or Extension

Areas of speciality
Demersal Fish
Shrimps / Prawns
Other Invertebrates
Algae
Plankton
Coastal Marine Waters
Coral Ecosystems
Petroleum Hydrocarbons
Metals
Halogenated Hydrocarbons

Objectives and programmes
History of institution, its mandate and purpose
The Muka Head Biological Field Station is one of the national research centres which became partially operational early 1979. The Station was jointly funded by the Government of Malaysia and a World Bank loan. Aquacultural facilities such as hatchery, fish pond and floating net cages were added in 1980. The Station's main activities are teaching and research in marine biology, aquaculture, terrestrial biology and related fields. The main objectives of the Station are:
- to promote the understanding of tropical biology through intensive multi-disciplinary research and to provide training facilities for technical staff and scientists from outside organizations

Research, monitoring and other activities in the last three years
- Aquaculture: Floating net cages and other modes of aquaculture are either developed or adapted in collaboration with the Station's academic staff. Some of these aquaculture practices are already adopted by fishermen throughout Malaysia.
- Fish diseases and immunity: Several ongoing projects investigate fish diseases and fish immunity
- Fish nutrition: The problems of fish infertility after prolonged captivity are also studied
- Hatchery operation: Research is conducted to examine the spawning of *Epinephelus* sp., *Lates calcarifer*, *Penaeus monodon* and *Macrobrachium rosenbergii*
- Terrestrial biology: Several academic staff from the School of Biological Sciences also investigate the productivity of coastal rain forest near the Station

Major current research and other activities
- Blue-green algae in Muka Head (Dr. S.T. Tan and Dr. I.G. Caunter)
- Biology of *Anadara* sp. (Mr. T.O. Liang)
- Gonad maturation of mangrove crabs (Dr. T.M. Wong)
- Aquaculture of *Penaeus monodon* and *P. meriguiensis* (Dr. H.C. Lai and Miss Bessie Ong)
- Coral reef ecology in Pulau Paya and Pulau Song-Song (Miss Helen Newman)
- Induced spawning of groupers (Dr. H.C. Lai)
- A study on the parasites of some marine fishes at Muka Head (Dr. T.S. Leong)
- A study of vibriosis in marine fishes at Muka Head and its control by vaccination (Dr. S.Y. Wong)
- Prevention of vibriosis in cultured fishes by vaccination (Miss Bessie Ong)
- Nutrition and preparation of artificial feeds for some commercially important cultured fishes in Penang (Dr. P.E. Lim)
- Fate and effect of naturally and chemically dispersed oil on tropical marine environment (Dr. H.C.Lai, Dr. T.E. Chua,

Objectives and programmes (Cont.)

Dr. T.S. Leong, Dr. M.C. Feng, Dr. C.L. Lim)
- Monitoring of PCBs persistent pesticides in seawater and rock systems (Dr. P.M. Sivalingam)
- Mussel-watch of pollutant (Dr. P.M. Sivalingam)
- Trace metal levels in surface planktonic communities (Dr. P.M. Sivalingam)

Future programmes
Continuation of current programme

Cooperative programme
The Station has active collaboration with other institutions such as Fisheries Research Institute at Glugor, Malaysia Agricultural Research and Development Institute (MARDI), International Foundation of Science (IFS) and ESSO Malaysia Berhad.

Training programme
Training program, especially at postgraduate levels can be arranged at a nominal fee. Immediate plan include an international course 'Special training course on productivity, food webs and nutrient cycling in Malaysian ecosystems' to be funded by UNESCO.

Institution structure
The Station is composed of the following sections:
- Aquaculture
- Hatchery
- Terrestrial Biology
- Orchidarium Reference Collection
- Technical Section (Maintenance and transport)
- Clerical Section

Staff
7 Professional staff 14 Technical staff 8 Other staff

Professional scientific staff:

Name	Degree	Speciality
Ishak T. Kechik	Ph.D.	Physiology
Lai Hoi Chaw	Ph.D.	Limnology
Ho Sinn Chye	Ph.D.	Limnology
Zubir b. Din	Ph.D.	Oceanography
Bessie Ong	B.Sc.	Marine Aquaculture
Khairun Yahya	B.Sc.	Plankton Biology
Ahbul Zailani Begum	B.Sc.	Ecology

Premises/facilities
Laboratory area: 560 m²

Equipment
Spectronic 20, salinometer (ME 111), reversing water sampler and other samplers, flame photometer (Model MW 111), hand winch, microscopes, plankton nets, dissolved oxygen meter (No. 114 WA 102 and EED 166), digital pH meter (Model E603), balances, centrifuges, workshop facilities, small boat, sampan, speed boat, rubber dinghy.

Aquarium facilities

Organisms maintained:
Demersal Fish Other Vertebrates Crustaceans

Species maintained for experimental purposes:

Skeletonema sp.	*Chlorella sp.*	*Tetraselmis sp.*
Mytilus sp.	*Macrobrachium rosenbergii*	*Penaeus monodon*
Tilapia sp.	*Lates calcarifer*	*Epinephelus sp.*

Research craft
Name: USM I
Length: 15 m.
Crew: 20
Special facilities:
Nansen bottles, current meter, submarine light meter, plankton nets, fish finder

Institution code: 000069 Information received: 20/06/83

Institut Penyelidikan Perikanan (IPP)

(Fisheries Research Institute)

Executive officer MOHD. SHAARI BIN SAM ABDUL LATIFF: Director

Postal Address

Institut Penyelidikan Perikanan (IPP)
Jalan Akuarium
GLUGOR, PENANG

Telephone: 04-881777/881941

Working languages
Bahasa Malaysia, English

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Fishing Technology
Aquaculture	Microbiology
Pollution	Computer / Information Systems

Areas of speciality

Demersal Fish	Pelagic Fish
Cephalopods	Shrimps / Prawns
Other Invertebrates	Coastal Marine Waters
Brackish Waters	Inland (Fresh) Waters
Mangroves Ecosystems	Petroleum Hydrocarbons
Metals	Halogenated Hydrocarbons
Pathogenic Micro-organisms	Nutrients

Objectives and programmes

History of institution, its mandate and purpose

Established in 1957 as a laboratory, was renamed later, with increased research activities, as the Fisheries Research Institute. The main objectives of the Institute are:

- to carry out research to develop, manage and conserve the marine, freshwater and brackishwater fisheries resources (capture as well as culture fisheries)
- to increase food production and uplift the socio-economic status of fishermen and fishfarmers.

Research, monitoring and other activities in the last three years

Continuation of current programme

Major current research and other activities

- Exploratory fishing and monitoring of demersal and pelagic fish resources in the Straits of Malacca and the South China Sea
- Experimental pelagic fishing
- Biological studies of selected fish and prawn species
- Study of trash catch composition
- Study of fishing gear
- Collection and analysis of commercial catch statistics
- Implementation of fish tagging programmes
- Monitoring of prawn resources
- Propagation and culture of marine, freshwater and brackishwater prawns and fish
- Culture of cockle, mussel and oyster
- Culture of live food organisms
- Seaweed culture (*Gracilaria*)
- Fish diseases
- Monitoring of pollution in rivers and coastal waters
- Toxicological studies on agricultural pesticides and oil dispersants
- Studies on bacterial contamination of marine organisms
- Oil pollution monitoring
- Monitoring of heavy metals in fish and shellfish
- Monitoring of chlorinated hydrocarbons in fish and shellfish
- Ecological development of artificial reefs
- Ecological studies of mangrove swamps in relation to coastal fisheries
- Pond grow-out of freshwater and brackishwater fish
- Pond grow-out of freshwater and brackishwater prawn
- Chemistry of brackishwater pond

Future programmes

Continuation of current programme

Cooperative programme

- Bilateral technical programme with Thailand on fisheries and aquaculture
- Bilateral technical programme with the Federal Republic of Germany on marine pollution
- Technical cooperation under SEAFDEC and ASEAN in the fields of fisheries, aquaculture and aquatic pollution

Objectives and programmes (Cont.)

Training programme
For departmental staff, staff of other governmental agencies, and university undergraduates

Institution structure

The Institute is made up of the following sections:
- Resource (Demersal Fisheries and Pelagic Fisheries Units)
- Aquaculture (Marine, Freshwater and Brackishwater Units)
- Aquatic Environment (Aquatic Pollution and Ecology/Conservation Units)
- Administration and Technical Services
- Field Stations: Gelang Patah, Jahore; Kuala Trengganu, Trengganu and Batu Berendam, Melaka
- Taxonomy room for marine/brackish/freshwater species of fish, prawns and molusces

Staff

49 Professional staff 67 Technical staff 210 Other staff

Professional scientific staff:

Name	Degree	Speciality
Mohd. Shaari, Sam Abdul Latif	M.Sc.	Marine biology, Resource assessment
Selvarajah, V.	B.Sc.	Resource assessment
Ong, Kah Sin	B.Sc.	Aquaculture, Marine biology
Jothy, Alexander A.	B.Sc.	Marine biology, Aquatic pollution
Liong, Pit Chong	B.Sc.	Aquatic pollution
Choo, Poh Sze	B.Sc.	Shellfish culture (mussel) Penaeid prawns (larviculture)
Lui, Yean Pong	B.Sc.	Demersal resources-fish, prawn
Ng, Fong Oon	M.Sc.	Shellfish culture
Hambal, Hanafi	B.Sc.	Culture (Macrobrachium)
Wang Portiah, Wan Hamzah	B.Sc.	Aquatic pollution, Toxicology
Chee, Phaik Ean	B.Sc.	Pelagic fisheries
Wong, Fau Hung	B.Sc.	Artificial reef development
Ismail, Ishak	B.Sc.	Aquatic pollution, Bacteriology
Faazaz, Abdul Latiff	B.Sc.	Shellfish culture
Ali, Awang	B.Sc.	Fish breeding
Othman, Muhamad	B.Sc.	Aquaculture, Water quality
Rodiah, Idris	B.Sc.	Aquatic pollution
Kamarruddin, Ibrahim	B.Sc.	Trash fish resources
Abu Talib, Ahmad	B.Sc.	Biology-marine prawn
Mohd. Akhir, Arshad	B.Sc.	Fishing gear
Mahyam, Mohd, Isa	B.Sc.	Commercial catch statistics
Che Utama, Che Musa	B.Sc.	Hatchery feed formulation
Mahdom, Ibrahim	B.Sc.	Oyster culture
Saniah, Yahaya	B.Sc.	Fish disease
Ahmad Adnan, Nuruddin	B.Sc.	Demersal resources
Mansor, Mohd. Isa	B.Sc.	Pelagic resources
Mohd. Taupek Mohd. Nasir	B.App.Sc.	Prawn resources
Shahunthala Devi, R.	B.Sc.	Aquatic pollution-heavy metals
Rohani, Ibrahim	B.Sc.	Aquatic pollution-toxicology
Sukarno, Wagiman	B.Sc.	Mangrove ecology
Mohd. Kushairi, Mohd. R.	B.Sc.	Mangrove ecology
Rashidah, M. Resat	B.Sc.	Culture of live food organisms
Devakie, Nair	B.Sc.	Culture of live food organisms
Alias, Man	B.Sc.	Demersal resources
Rosidi, Ali	B.Sc.	Squid resources
Chai, Hon Leong	B.Sc.	Pelagic fish resources
Abdul Hamid, Yasin	B.Sc.	Pelagic fish resources
Ti, Teow Loon	B.Sc.	Brackishwater fish culture
Chuah, Toh Thye	B.Sc.	Brackishwater prawn culture
Rosly, Hassan	B.Sc.	Brackishwater pond chemistry
Ismail, Abu Hassan	B.Sc.	Feed formulation
Ramli, Khamis	B.Sc.	Brackishwater fish culture
Ahmad A. bin Othman	B.Sc.	Exotic and local carp culture
Thalasian bt. Saidin	B.Sc.	Freshwater fish culture (local excl. carp)
S. Pathmasothy	B.Sc.	Feed formulation (freshw.fish)
Siti Zahrah bt. Abdullah	B.Sc.	Freshwater fish disease
Zulkafli bin Abdul Roshidi	B.Sc.	Freshwater fish cage culture, Limnology
Ismail bin Awang Kechik	B.Sc.	Freshwater mono/polyculture, Freshwater fish/prawn
Chuah Hean Peng	B.Sc.	Tilapia culture

Premises/facilities
Building area: 2700 m² Laboratory area: 950 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1500
Number of periodical subscriptions:190

Monographs and serials titles:
- Fisheries Bulletin (English, exchange/sale, a Fisheries Division publication)
- Annual Fisheries Statistics (English/Bahasa Malaysia, exchange/sale, a Fisheries Division publication)
- Annual Reports of the Fisheries Research Institute (English, restricted, an Institute publication)
- 'Berita Nelayan' (Fishermen's News): Bahasa Malaysia, free, a Fisheries Division publication
- 'Risalah Perikanan' (Fisheries Pamphlets): English/Bahasa Malaysia, free, a Fisheries Division publication
- Malaysian Agriculture Journal (English, exchange/sale, a Ministry of Agriculture publication to which fisheries research papers are contributed)

Equipment
Refrigerators, deep-freeze, isotherm refrigerated bath, ovens (heating, drying, wax-embedding), incubator, autoclave, muffle furnace, air compressors, air blower, water sterilizer, water destiller/deionizer, diatomaceous earth filter, submersible water pumps, electric generator (portable), electronic balance, electronic calculators, computer, photocopy machine, slide projector, cine projector (16 mm), cameras, microscopes (dissecting, standard, research, plankton), shadowgraph, microtome (rotary, freezing), automatic tissue processors, Nansen bottles, Kitahara water samplers, reversing thermometers, bathythermographs, Van Veen bottom sampler, plankton nets, neuston nets, in-situ salinometers, turbidity meters, current meters, spectrophotometer, pH-meters, echo sounders, fish finders, sonar, SCUBA equipment, unterwater communication system, inflatable dinghies, underwater camera, atomic absorption spectrophotometer, gas chromatograph, spectrofluorometer, tissue homogenizer, flask shaker, pressure-digestion apparatus.

Research craft

Name:	K.K. JENAHAK
Length:	23 m.
Type:	Stern trawler
Date of construction:	1970
Crew:	12
Scientists:	3
Lab. space:	6 m2

Special facilities:
Trawl winch, hydraulic steering, echosounder, radar.

Name:	K.K. AYA
Length:	29 m.
Type:	Purse seiner
Date of construction:	1975
Crew:	11
Scientists:	3

Special facilities:
Winches, hydraulic steering, echosounder, radar.

Name:	K.K. KERAPU I
Length:	17 m.
Type:	Stern trawler
Date of construction:	1975
Crew:	7
Scientists:	2

Special facilities:
Trawl winch, hydraulic steering, echosounder, radar.

Name:	K.K. PELALING
Length:	16 m.
Type:	Stern trawler
Date of construction:	1980
Crew:	8
Scientists:	2

Special facilities:
Trawl winch, hydraulic steering, echosounder, radar.

Research craft (Cont.)

Name:	K.K. MERSUJI
Length:	23 m.
Type:	Multi-purpose
Date of construction:	1982
Crew:	10
Scientists:	5
Lab. space:	6 m2

Special facilities:
Combination winch, towline winch, power block, line hauler, purse-seine davit, hydraulic steering, radar, satellite navigator, auto direction finder, radio telephone, sonar, colour fish finder.

Institution code: 000070 Information received: 29/07/83

**Bahagian Alam Sekitar/Kawalan Pencemaran,
Jabatan Marin, Petroliam Nasional Berhad**

(Environment/Pollution Control Section, Marine Department, National Petroleum Company of Malaysia (PETRONAS))

Executive officer AHMAD Ismail: Head of Section

Postal Address

**Bahagian Alam Sekitar/Kawalan Pencemaran,
Jabatan Marin, Petroliam Nasional Berhad
Plaza Pekeliling, Jalan Tun Abd. Razak
P.O. Box 2444
KUALA LUMPUR 02-15**

Telephone: 03-912033
Telex: PETRON MA 30032,30696

Working languages
English, Malay

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Resources Management	Oceanography
Chemical Sciences	Physical Sciences
Offshore Technology	Pollution
Engineering	Meteorology / Climatology
Mineral Resources (incl. Oil)	Policy and Planning
Mutual Assistance / Technology Transfer	Social Sciences
Computer / Information Systems	Education, Training or Extension

Areas of speciality

Benthos	Mineral Oil
Thermal	Offshore Marine Waters
Coastal Marine Waters	Brackish Waters
Inland (Fresh) Waters	Mangroves Ecosystems
Coral Ecosystems	Petroleum Hydrocarbons

Objectives and programmes

Petroliam Nasional Berhad (PETRONAS) was incorporated as National Petroleum Corporation of Malaysia on the 17 August 1974 and registered under the Company's Act 1965. The supervision of marine activities by its Marine Department should enhance the safety of all marine and offshore operations as well as minimising pollution. The following are activities of the PETRONAS Marine Department:

- Environment/Pollution Inspection
- Environmental/Pollution Related Studies/Research (e.g. Coastal Resources, Environmental Impact Assessment, Oil Residue Survey, Effects of Crude Oil on Macrobenthos, Biodegradation of Oil etc.)
- Contingency Plan
- Environmental/Pollution Survey
- Wastewater Treatment Facilities

Cooperative programme

- Government Institution (Department of Environment, Ministry of Science, Technology and Environment; Federal Marine Department; Royal Customs and Excise Department of Malaysia; Immigration Department of Malaysia; Meteorological Department of Malaysia; National Council of Scientific Research and Development, Ministry.)
- Academic (University Science of Malaysia; Agricultural University of Malaysia; National University of Malaysia.)
- Regional (ASEAN Council on Petroleum (ASCOPE); United Nations Environment Programme (UNEP); Committee for Coordination of Joint Prospecting for Mineral Resources in ASEAN Offshore Areas (CCOP)).
- International (United Nations Environment Programme (UNEP); East-West Center; International Maritime Organisation (IMO); E and P Forum)

Training programme

In addition to several courses on modern oil technology and methods for management and development of those activities the PETRONAS also organizes courses on oil spill control.

Institution structure

The structure of the Marine Department is as follows:

- Administration Section
- Marine Operations Section
- Environment/Pollution Control Section
- Marine Safety Section
- Marine Consultancy Section
- Communications and Control Section

Staff
3 Professional staff 24 Technical staff 14 Other staff

Professional scientific staff:

Name	Degree	Speciality
Ismail Ahmad	B.Sc.	Environmental chemistry, Engineering
Mohd Nasr Hassan	B.Sc.(Environment)	Solid waste management, Water pollution control, Air pollution control
Ahmad Hamizan Hassan	B.Sc.(Hons)	Chemical engineering

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 14700
Number of periodical subscriptions:160

Equipment
Atomic absorption spectrophotometer, gas chromatograph, ultra-violet spectrometer, infra-red spectrometer, X-ray sulphur analyser, bomb calorimeter, Wickhold sulphur analyser, Datawell waverider, Baylor wavestaff, Foxboro water level recorder, Aanderaa water level recorder, electromagnetic current meters, Hydrolab water quality and temperature recorder, anemometer, rainfall recorder, wet and dry bulb hygrometer, thermograph, barograph, sun-shine recorder, echosounder depth measuring equipment, surface positioning/fixing equipment, distance measuring equipment, side scan sonar, angle measuring equipment, 11 standby vessels, landing craft, 8 mooring/tug boats, 7 crew boats, utility vessel, 7 supply vessels, several drilling/pumping and production platforms, several jackets.

Research craft

Name:	OIL CREEK
Owner:	Lombardo Marine (M) Sdn. Bhd.
Length:	27 m.
Type:	Survey vessel
Date of construction:	1974
Crew:	6
Scientists:	9

Institution code: 000071 Information received: 09/11/83

Aquaculture Department, Southeast Asian Fisheries Development Center (SEAFDEC AQD)

Executive officer SANTIAGO , Alfredo, Jr. C.: Chief

Postal Address

Aquaculture Department,
Southeast Asian Fisheries Development Center (SEAFDEC AQD)
9th Floor, State Financing Center, Ortigas Avenue
MANDALUYONG, METRO MANILA

Telephone: 7210423/7210428/7210429
Telex: 29078 SEAFDEC PH
Cable: SEAFDEC, MANILA

Working languages
Pilipino, English

Nature of institute
Inter-Governmental

Main fields of activities
Ecological Sciences
Aquaculture
Chemical Sciences
Engineering
Education, Training or Extension
Inland Fisheries
Limnology
Microbiology
Marketing / Economics

Areas of speciality
Demersal Fish
Other Invertebrates
Micro-organisms
Brackish Waters
Shrimps / Prawns
Algae
Plankton
Inland (Fresh) Waters

Objectives and programmes

The SEAFDEC AQD was formally established in 1973 to develop modern technologies and provide the research and development impetus for tapping Southeast Asia's vast potentials for aquaculture. AQD promotes, undertakes and coordinates aquaculture research relevant and appropriate for the region; develop human resources for aquaculture development; and disseminates and exchanges information in aquaculture. The research thrusts of AQD are on the development of appropriate technologies in support of priority programs to increase food production, livelihood opportunities, and export-oriented industries. Research programs are focused on problem areas specific to economically important aquatic groups: crustaceans, finfishes, molluscs and seaweeds.

Cooperative programme

The Department maintains relationships with governments and international and national agencies and organizations involved in aquaculture research and development. Support from other organizations and governments come in form of cash, training, research, and equipment grants. The following are the organizations with which the Department maintains linkages:

- IDRC for milkfish research
- UNDP/FAO Network of Aquaculture Centres in Asia for a graduate training program
- International Foundation of Science (Sweden)
- Japanese International Cooperating Agency (JICA)
- Government of France
- DANIDA
- University of Heidelberg
- University of Rhode Island
- United Kingdom
- New Zealand
- Belgium

Training programme

Training courses on the following areas are conducted regularly: culture of prawns, mussels and oysters; breeding and pond culture of milkfish; cage and pen culture of tilapia; production of food organisms for hatcheries; small-scale prawn hatchery operation; aquaculture engineering, and project development and management. Extension activities include on-site and practical training on specific aquaculture systems and techniques intended for students, government personnel and technicians, which are conducted upon request by the privat sector.

Institution structure

AQD is headed by a Department Chief and assisted by JICA expert, apponted as Deputy Chief. The three main divisions: Research, Training and Extension, and Administration are headed by Directors. Under the Research Division, Program Officers coordinate the various researches in the different stations and substations, while Station Heads take care of the administrative management of the Stations.

The Department operates three research stations: one in Tigbauan,

Institution structure (Cont.)

Iloilo, which is the main station and housed within the general headquarters, one in Leganes, Iloilo for brackishwater research, and one in Binangonan, Laguna for freshwater research. In addition, AQD operates substations in Batan, Aklan; Igang, Guimaras Island; Naujan, Mindoro Oriental, and Casanayan, Capiz. External Affairs and Liaison Offices are located in Metro Manila and Iloilo City. The figures for staff and premises/facilities are given for Tigbauan Research Station only.

Staff

94 Professional staff 227 Technical staff 402 Other staff

Professional scientific staff:

Name	Degree	Speciality
Jesus V. Juario	Ph.D.(Biology)	Finfish breeding, Larval rearing
Cesar T. Villegas	Ph.D.(Aquaculture)	Genetics, Natural food
Felicitas P. Pascual	Ph.D.(Nutrition)	Fish nutrition
Rogelio Gacutan	Ph.D.(Plant path.)	Fish pathology
Adam Young	M.S.(Marine biol.)	Mollusc culture
Lita Benitez	Ph.D.(Chemistry)	Protein, Enzyme chemistry
Gilda Po	M.(Public health)	Fish pathology
Nepheronia Jumalon	M.S.(Fisheries)	Artemia culture
Marietta Duray	M.S.(Biology)	Finfish larval rearing
Shiro Hara	B.S.(Aquaculture)	Sperm preservation
Antonio Villaluz	M.S.(Zoology)	Fish breeding, Fish culture
Ronaldo Ferraris	Ph.D.(Zoology)	Physiology
Pura Requintina	M.S.(Fisheries)	Finfish broodstock development
Gerald Quinitio	M.S.(Fisheries)	Finfish broodstock development
Florentino Apud	M.S.(Fisheries)	Fish culture
Beato Pudadera	M.S.(Aquaculture)	Prawn culture
Dan Baliao	M.S.(Fisheries)	Brackishwater pond culture
Corazon Santiago	Ph.D.(Aquaculture)	Fish nutrition, Freshwater culture
Antonio Bautista	Ph.D.(Agriculture)	Tilapia breeding, Tilapia culture
Julia Pantastico	Ph.D.(Botany)	Planktologist
Zubaida Basiao	M.S.(Zoology)	Tilapia breeding
Alfredo Santiago, Jr.	Ph.D.(Aquaculture)	Fish nutrition, Fish culture
Porfirio Gabasa, Jr.	M.S.(Fisheries)	Prawn hatchery, Prawn culture
Jurgenne Primavera	M.S.(Zoology)	Prawn broodstock development
Pastor Torres, Jr.	M.S.(Engineering)	Aquaculture engineering
Einstein Laviña	Ph.D.(Zoology)	Crab ecology
Marlo Tabbu	M.S.(Fisheries)	Mollusc culture
Masanori Suemitsu	B.S.(Fisheries)	Prawn culture
Rosario Pudadera	M.S.(Fisheries)	Prawn broodstock development
Clarissa Marte	M.S.(Zoology)	Finfish broodstock development
Lillian Tiro	M.S.(Fisheries)	Fish nutrition
Veronica Alava	M.S.(Fisheries)	Fish nutrition
Fermin Palisoc	M.S.(Zoology)	Parasitology
Erlinda Cruz	M.S.(Fisheries)	Fish pathology
Ma. Cecilia Baticados	M.S.(Marine Biology	Fish pathology
Leonardo Tiro, Jr.	M.S.(Bio-resources)	Fish breeding, Fish culture
Relicardo Coloso	M.S.(Biochemistry)	Fish biochemistry
Mae Catacutan	M.S.(Fish. science)	Marine animal nutrition
Myrna Bautista	M.S.(Food science)	Nutrition
Eva Aujero	M.S.(Biology)	Biology
Oseni Millamena	M.S.(Engineering)	Environmental engineering
Veronica Peñaflorida	M.S.(Agriculture)	Animal science
Isidra Tuburan	M.S.(Fisheries)	Aquaculture
Jonathan Nacario	M.S.(Marine biol.)	Reproductive physiology
Herminigildo Sitoy	Dipl. Marine biol.	Ecology, Mariculture of molluscs, Mariculture of seaweeds, Mariculture of finfish
Dioscoro dela Peña	M.S.(Fisheries)	Ecology, Hatchery + nursery
Adam Young	M.S.(Marine biol.)	Mariculture of molluscs, Mariculture of seaweeds
Paciencia Young	M.S.(Biology)	Larval physiology
Rolando Platon	Ph.D.(Engineering)	Aquaculture engineering
Angelito Vizcarra	M.S.(Bio-resources)	Aquaculture engineering
Arthur Sanchez	Ph.D.(Oceanography)	Chemical oceanography
Jose Llobrera	Ph.D.(Fisheries)	Aquaculture
Alcestis Llobrera	Ph.D.(Food science)	Microbiology
Corazon Dueñas	M.S.(Zoology)	Larval physiology

Staff (Cont.)

Name	Degree	Speciality
Celia Orano	M.S.(Marine biol.)	Bivalve reproductive biology, Planktology
Ma. Teresa de Castro	M.S.(Environment)	Water pollution
Gloria Pution	M.S.(Fisheries)	Aquaculture
Nilda Tabbu	M.S.(Fisheries)	
Ilda Gorriceta	M.S.(Chemistry)	Biochemistry
Yoshibumi Yashiro	B.S.(Marine biol.)	Prawn hatchery (Indoor)
Teodora Bagarinao	M.S.(Marine biol.)	Fish ecology
Enrique Avila	M.S.(Biology)	Culture, Electron microscopy
Fe Estepa	M.S.(Fisheries)	Aquaculture
Emilia Quinitio	M.S.(Fisheries)	Seed production of Penaeids
Vincente Ba ada	M.S.(Marine biol.)	
Edgardo Reyes	M.S.(Fisheries)	Hatchery, nursery + grow-out, Training and extension
Maximiano Rivera	Ph.D.(Education)	Aquaculture
Jesus Almendras	M.S.(Marine biol.)	Finfish breeding
Josefa Tan	M.S.(Zoology)	Fish physiology
Luis Ma. Garcia	M.S.(Zoology)	Fish breeding
Arnil Amata	M.S.(Fish physio.)	Fish physiology
Fernando Sunaz	M.S.(Fisheries)	Prawn hatchery
Danilo Israel	M.A.(Economics)	Aquaculture
Imelda de Mesa	M.S.(Statistics)	Aquaculture statistics
Ruby Bombeo	M.S.(Fisheries)	Artemia culture
Catherine Tamse	M.S.(Fisheries)	Pathology
Roselyn Duremdez	M.S.(Fisheries)	Pathology
Milagros Uy	Dip Marine Chem	BioChemistry
Leo Ver	M.S.(Fisheries)	Mariculture of molluscs
Rufino Ignacio	M.S.(Elec.Eng.)	Aquaculture engineering
Ernesto Gonzales	M.S.(Economics)	Aquaculture economics
Socorro Castro	M.S.(Biology)	Freshwater fish culture
Belen Acosta	M.S.(Fisheries)	Freshwater fish culture
Rodrigo Lacierda	M.S.(Aquaculture)	Aquaculture
Pepito Valera	M.S.(Aquaculture)	Aquaculture
Dante Garochi	M.S.(Aquaculture)	Aquaculture
Jesse Bruno	M.S.(Fisheries)	Aquaculture
Noel Solis	M.S.(Biology)	Aquaculture
Precilla Subosa	M.S.(Env.Eng.)	Soil Chemistry
Kayl Corre	M.S.(Fisheries)	Aquaculture
Mario Dimaano	M.S.(Fisheries)	Aquaculture
Ma. Suzette Licop	M.S.(Zoology)	
Elsie Tech	M.S.(Marine biol.)	
Romeo Mesa	M.S.(Fisheries)	

Premises/facilities
Building area: 5540 m² Laboratory area: 8848 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 16000
Number of periodical subscriptions:358

Equipment
Gas chromatograph, amino acid analyzer, incubators, microtomes, tissue embedding center, honing plate, ovens, tissue processor, demineralizer, fraction collector, spectrophotometer, ultrasonic desintegrator system, crude fiber determination apparatus, multi-purpose electrophoresis chamber, nitrogen digesting apparatus, densitometer, flame photometer, pyrometer, atomic absorption and flame emission spectrophotometer, calorimeter, oven vacuum drying, cryostat, osmometer, microscope with photomicrographic camera, blood gas apparatus, X-TR compact photomicrographic camera, carbon dioxide incubator, centrifuge (clinical), freeze dryer, low temperature incubator, thermostatic incubator, bomb calorimeter, refrigerated centrifuge, Willey type mill, California pellet mill, Melacel, Ultipor, moisture jeller, Karl Kolb ball mill, super soft X-ray apparatus, flourophotometer, amino acid determination apparatus, chromatograph, extraction apparatus.

Aquarium facilities
Total area: 1882 m²

Organisms maintained:

Demersal Fish	Pelagic Fish	Molluscs
Crustaceans	Algae	Micro-organisms

Species maintained for experimental purposes:

Chanos chanos	*Lates calcarifer*	*Penaeus spp.*
Siganus spp.	*Mugil spp.*	*Scylla serrata*
Artemia salina	*Perna viridis*	*Crassostrea iredalei*
Eucheuma spp.	*Caulerpa spp.*	*Placuna placenta*
Pholas orientalis	*Gracilaria spp.*	

Research craft

Name:	SEAFDEC XVIII
Owner:	SEAFDEC
Length:	13 m.
Type:	Motor banca
Date of construction:	1978
Crew:	2

Name:	SEAFDEC I
Owner:	SEAFDEC
Length:	10 m.
Type:	Fiberglass boat
Date of construction:	1974
Crew:	6

Name:	SEAFDEC II
Owner:	SEAFDEC
Length:	15 m.
Type:	Fiberglass vessel
Date of construction:	1975
Crew:	6

Name:	SEAFDEC XXI
Owner:	SEAFDEC
Length:	7 m.
Type:	Fiberglass jetboat
Date of construction:	1977
Crew:	2

Institution code: 000010 Information received: 01/12/83

Department of Chemistry, Ateneo de Manila University

Executive officer SCHMITT, William J.: Chairman

Postal Address

Department of Chemistry, Ateneo de Manila University
P.O. Box 154
QUEZON CITY, M. MANILA

Telephone: 998721-25/982541-45

Working languages
English, Pilipino

Nature of institute
Private (non-profit)

Main fields of activities
Pollution
Education, Training or Extension
Geology (incl. Sedimentology)

Areas of speciality
Demersal Fish
Halogenated Hydrocarbons
Metals

Objectives and programmes
History of institution, its mandate and purpose
The University was founded as a small college during the Spanish regime in the Philippines in 1859. The status changed to University in 1959 when the University was established by the Society of Jesus (The Jesuits). The main objectives are: educational and incidentally research (basic and industrial chemical research)
Research, monitoring and other activities in the last three years
Continuation of current programme
Major current research and other activities
The Department is currently on the 3rd year of a nation-wide survey of mercury and other heavy metals (lead, cadmium, zinc, copper and arsenic) in water, sediments and aquatic organisms. This work is performed in cooperation with : a) the Philippines Atomic Energy Commission b) the Food and Nutrition Research Institute c) the National Pollution Control Commission d) the Bureau of Fisheries and Aquatic Resources and e) the National Science Development Board (from which support emanates).
Future programmes
Pesticide residues in the marine environment, proposed in co-operation with the University of the Philippines Marine Sciences Centre
Cooperative programme
See Major current research and other activities and Future programmes
Training programme
Training programs on various instruments such as gas chromatographs, atomic absorption spectrophotometers etc. for governmental and industrial staff.

Institution structure
The Department of Chemistry is one of the departments of the Graduate School and College of Arts and Sciences, which is the major unit of the University. Other units are: a grade school, a high school, a law school, a school of theology, a graduate school of business.

Staff
14 Professional staff 3 Technical staff 0 Other staff

Professional scientific staff:

Name	Degree	Speciality
Schmitt, Rev. William J.	Ph.D.	Organic chemistry
Chua, Modesto T.	Ph.D.	Organic chemistry, Natural products
Javellana, Anna Maria	Ph.D.	Natural products
Kapauan, Armando F.	Ph.D.	Physical chemistry
Samson, Antonio S.	Ph.D.	Organic chemistry
Aquino, Cristina	M.Sc.	Analytical chemistry
Balalta, Salvador	M.Sc.	

Premises/facilities
Laboratory area: 800 m²
With facilities for:
Students: 20

Equipment
Two gas chromatographs (with FID, TCD and ECD), 50 tube counter-current extractor, IR spectrophotometer, high pressure liquid chromatograph system, 2 atomic absorption spectrophotometers, UV-VIS recording spectrophotometer, small mass spectrometer, 60 MHz nuclear magnetic resonance spectrometer, 2 IR spectrophotometers (for students) and 2 gas chromatographs (for students).

Institution code: 000011 Information received: 25/08/77

Institute of Marine Science, Xavier University

Executive officer MC KEOUGH, James A.: Director

Postal Address

Institute of Marine Science, Xavier University
CAGAYAN DE ORO CITY, 8401

Telephone: 37-42

Working languages
Pilipino, English

Nature of institute
Academic Private (non-profit)

Main fields of activities
Biological Sciences
Chemical Sciences
Physical Sciences
Education, Training or Extension

Objectives and programmes
History of institution, its mandate and purpose
The Department of Biology, in collaboration with the other science departments, aims to give a broad education in the biological and related sciences through general and introductory courses. It also offers opportunities for study and research in the various marine environments. It trains students in the methods and techniques of scientific investigation in the field and laboratory. It also encourages to advance and communicate knowledge of the marine environment for the benefit of society. The Department performs also oriented research in physics, chemistry, biology with emphasis on marine biology.
Research, monitoring and other activities in the last three years
- A general hydrographic survey of Macajalar Bay
- Biological study of sardines and flying fish
- Study of goby fry

Major current research and other activities
Water pollution and marine ecological study of Macajalar Bay
Future programmes
Continuation of current programme
Cooperative programme
Xavier University is a charter member of the Federation of Institutions for Marine and Freshwater Sciences (Xavier, Ateneo de Davao, Mindanao State University, University of San Carlos, Silliman University) founded in 1968 to promote and to stimulate education and research in the marine and freshwater sciences through cooperative and coordinated efforts of the member institutions. Xavier University is also included by the Philippine Council for Agriculture and Resources Research in the national network of research centres and cooperating stations in the field of marine fisheries. It also cooperates with the Bureau of Fisheries, the National Pollution Control Commission and the Coast Guard in pollution studies.
Training programme
The University offers a B.Sc. in marine biology. This four-year course comprises liberal arts subjects and the following subjects in mathematics, physics, chemistry, oceanography and biology:
- Mathematics (Modern College Algebra, Plans Trigonometry, Statistics)
- Physics (General College Physics I and II)
- Chemistry (General Inorganic Chemistry, Qualitative Chemistry, Organic Chemistry I)
- Oceanography (General Oceanography, Chemical Oceanography)
- Biology (General Botany, General Zoology, Marine Invertebrate Zoology, Comparative Anatomy, Marine Ecology, Phycology, Marine Planktonology, Ichthyology, Marine Embryology, Marine Physiology, Aquaculture, Seminar Problem)

Institution structure
The Xavier University accommodates:
- Graduate School
- Colleges of Law, Agriculture, Arts and Sciences, Commerce, Education, Engineering, Medicine
- Departments - Philosophy, Religious Studies, Philippine Studies, History, Political Science, Economics, Sociology, Anthropology, Biology, Chemistry, Mathematics, Physics, English, Spanish, Pilipino, Psychology, Guidance, Accounting, Business Administration, Business Law
- Institute of Marine Science (annexed to the Department of Biology)
- Marine Science Society

Staff

Professional scientific staff:

Name	Degree	Speciality
Abanail, G.E	M.A.,ED.	Biology
Abanil, G.J. (Ms)	MAT.	Biology
Zarsuelo, J.C. (Ms)	M.Sc.	Biology (Algae)
Rivera, D. (Ms)	B.Sc.	Marine biology
McKeough, Rev. J.A.	M.Sc	Biology
Kwong, L.G. (Ms)	M.Sc.	Chemistry
Teru, T. (Ms)	B.Sc.	Biology

Equipment
Pentax camera, analytical balances, pH meter, research microscopes, ovens, dark room enlarger.

Aquarium facilities

Organisms maintained:
Demersal Fish Other Invertebrates

Institution code: 000012 Information received: 16/03/81

Pangasiwaan sa Pagpapaunlad sa Look ng Laguna

(Laguna Lake Development Authority (LLDA))

Executive officer REY, Teodoro C.: Acting General Manager

Postal Address

Pangasiwaan sa Pagpapaunlad sa Look ng Laguna
Rizal Provincial Capitol, 3rd Floor
P.O. Box PASIG
METRO-MANILA 3133

Telephone: 693-4515/693-4805

Working languages
Pilipino, English

Nature of institute
Governmental

Main fields of activities
Inland Fisheries
Limnology
Aquaculture
Pollution

Areas of speciality
Demersal Fish
Other Invertebrates
Micro-organisms
Brackish Waters
Petroleum Hydrocarbons
Shrimps / Prawns
Algae
Plankton
Inland (Fresh) Waters
Nutrients

Objectives and programmes
History of institution, its mandate and purpose
The Laguna Lake Development Authority became operational in 1970. Its terms of reference are economic development of the area around the Lake, both industrial and agricultural, and the supply of drinking water to greater Manila and Lake communities.
The enabling Act establishing the Authority in 1966 was amended by Presidential Decree No. 813 in 1975 which gives additional powers to the Authority, particularly, power to regulate and manage the water quality of the Lake for its multipurpose uses. The main objective of the Authority is to implement the before mentioned Presidential Decree; its developmental and regulatory provisions with due regards to the maintenance of the environmental balance.
The main activities of the Authority are in the fields of limnology; wastewater treatment; solid waste treatment and aquaculture.

Research, monitoring and other activities in the last three years
The Authority continued with :
- monitoring programme of the Lake water quality especially of its physical, chemical and biological characteristics
- research on wastewater treatment and production and harvesting of algae
- treatability study, in particular, study on the treatment of pulp wastewater
- study of water quality requirements for fish productivity, and
- study of primary productivity of the Lake

Major current research and other activities
- Lake productivity, its correlation to water quality (Mr. R. Manot)
- Algal-rapid-growth in ponds to stabilize organic wastewater by symbiotic action of bacteria and algae and harvest the algae for its protein value for animal feed (Mr. R. Manto and Ms. A. Santos)
- Monitoring of the Lake water quality to detect effectivity of pollution control measures
- Monitoring of industrial processes for compliance with effluent and water quality criteria, (Mr. J.D. Centano, Jr.)
- Survey of attitudes of the Lake residents on the construction of the regional interceptor sewer and their willingness to support capital and/or operation and maintenance costs
- Treatability study of the processes waste from a pulp-paper mill and a sugar refinery (Mr. J. D. Centeno, Jr.)
- Planning and designing of a river interceptor to prevent the inflow of wastewater into heavily polluted river and to minimize the inflow of pollutants into the Lake
- Land use and town planning

Future programmes
- Monitoring of Lake water quality;
- Study of Lake nutrient dynamics;
- Secondary productivity study;
- Watershed management programme;
- Hydrographic survey of the Lake;
- Solid waste demonstration project;
- Computerization of industrial effluents;
- Integrated swine waste management project;

Objectives and programmes (Cont.)
- **Pre-operational study of the hydraulic control structure (water circulation);**
- Field study on the effect of supplemental feeding on Nile Tilapia production in cages

Cooperative programme
The Authority works in close collaboration with agencies like:
- National Water Resources Council
- National Pollution Control Commission
- National Environmental Protection Council
- Human Settlement Regulatory Commission
- Bureau of Fisheries and Aquatic Resources
- Technology Resource Center
- Philippine Coast Guard (on oil pollution control)

Training programme
In service training (limnology and water quality management) Laboratory facilities and pilot scale demonstration project on waste water treatability are available.

Institution structure
The Authority is governed by a Board of Directors and its day-to-day affairs are managed by a General Manager (presently on an acting capacity). It has seven divisions, each headed by a Manager. It operates a water and wastewater laboratory headed by Ms. Z. Villafuerte, a chemist, under the supervision of Mr. Julian D. Centeno, Jr., a chemical engineer, who is the manager of the Environmental Protection Division. Mr. Benedicto L. Adan, a sanitary engineer consultant, provides advisory assistance. The Authority has a branch office at Fort Bonifacio and field offices at Looc, Cardona town with an aquaculture project. At Los Banos town there is a Fishpen Development Project, at Mabitac town an Irrigation Demonstration Project and at Tanay town a Tree Farm Project.

Staff

Professional scientific staff:

Name	Degree	Speciality
Adan, Benedicto L.	M.Sc.	Architecture, Architectural engineering, Sanitary engineering
Cabance, N.	B.Sc.	Chemical engineering
Cabrera, R.	B.Sc.	Fisheries
Cabuenos, A.	B.Sc.	Zoology
Centeno, Julian Jr. D.	M.Sc.	Chemical engineering, Environmental Engineering
Gabriel, B.C.	Ph.D.	Entomology, Ecology
Garcia, A.	B.Sc.	Fisheries
Gemeniano, D.D.	B.Sc.	Sanitary engineering
Guerrero, R.D.	Ph.D.	Applied zoology, Fisheries management
Guzman, de M.	B.Sc.	Chemistry
Ignacio, C.T.	B.sc.	Chemical engineering
Lauriault, P.A.	M.Sc.	Sanitary engineering
Mane, A.M.	M.Sc.	Fisheries
Manto, R.H.	B.Sc.	Botany
Santos, A.	B.Sc.	Biology
Villafuerte, Z.L.	B.Sc.	Chemistry

Premises/facilities
Building area: 50000000 m

Information facilities
Monographs and serials titles:
- LLDA Annual Report (English)
- Water Quality Management Study Report (English)
- Limnology of Laguna Lake (English)
- Technical Bulletin on Fishery (English)

Equipment
UV-VIS spectrophotometer, IR spectrophotometer, atomic absorption spectrophotometer, gas chromatograph, mercury analyzer, microscopes (inverted, compound, stereozoom), Kjeldahl apparatus, air compressor, automatic D.O. recorder, garbage grinder, automatic water and wastewater sampler, and all other requirements for biological and bacteriological studies.

Aquarium facilities

Aquarium facilities (Cont.)

Organisms maintained:

Demersal Fish	Crustaceans	Other Invertebrates

Species maintained for experimental purposes:

Chanos chanos	*Macrobrachium spp.*	*Chlorella sp.*
Microcystis sp.	*Scenedesmus sp.*	*Stephanodiscus sp.*
Melosira sp.	*Anabaena sp.*	*Raphideopsis sp.*
Stenodinum sp.		

Research craft

Name: MALINAS NA TUBIG I
Length: 10 m.
Special facilities:
for limnological work

Name: MALINAS NA TUBIG II
Length: 5 m.
Special facilities:
for monitoring

Institution code: 000013 Information received: 06/07/83

Institute of Fisheries Development and Research
College of Fisheries, University of the Philippines (IFDR)

Executive officer MINES, A. N.: Director

Postal Address

Institute of Fisheries Development and Research
College of Fisheries, University of the Philippines (IFDR)
Diliman
QUEZON CITY 3004

Working languages
English, Pilipino

Nature of institute
Governmental Academic

Main fields of activities

Biological Sciences	Marine Fisheries
Inland Fisheries	Fishing Technology
Food Sciences / Food Technology	Aquaculture
Oceanography	Limnology
Marketing / Economics	Social Sciences

Areas of speciality

Demersal Fish	Pelagic Fish
Other Invertebrates	Coastal Marine Waters
Brackish Waters	

Objectives and programmes

History of institution, its mandate and purpose

The Institute of Fisheries Development and Research was established by Republic Act 4514 within the College of Fisheries of the University of the Philippines to undertake basic and applied research in marine fisheries, inland fisheries and fisheries processing technology on 25 January 1965. Its objectives are to undertake basic and applied research in the major fields of fisheries for enriching and applying the knowledge obtained for the development of the fishing industry.

The Institute performs basic applied research on marine fisheries, aquaculture, fisheries biology, fishing methods, fish processing technology, inland water fisheries and fisheries socio-economics.

Research, monitoring and other activities in the last three years

Monitoring of production potentials of important trawl fishing grounds.

Development of productive fish culture techniques in brackishwater ponds for finfish and invertebrates.

Exploration, echo survey and test fishing of non-traditional trawl fishing grounds.

Fish fermentation studies; socio-economic studies of small-scale fishermen.

Major current research and other activities

Oceanography, fisheries trawl fishing investigation in the Visayan Sea (the Visayan Sea is the most productive fishing ground for the trawl gear in the Philippines, Dr. V. Aprieto)

Hydrological study of Samar Sea (Mr. A.N. Mines and Dr. E. Flores)

Small-scale fisheries of San Miguel Bay (Mr. A.N. Mines in cooperation with ICLARM)

Future programmes

Investigations of purse seine fishing grounds (traditional and non-traditional grounds)

Socio-economic problems of subsistence fishing

Effects of pesticides on fishpond production

Improved techniques of brackishwater aquaculture for finfish and invertebrates (shrimps, oysters, mussels, etc.)

Improved techniques of cottage fish processing technology

Cooperative programme

See Training programme

Training programme

- Training and extension services, for fishfarmers, in fishpond techniques (in cooperation with the Bureau of Fisheries and Aquatic Resources, Quezon City)
- Training of high school teachers in fisheries
- M.Sc. (Fisheries Biol.)
- M.Sc. (Fish Processing Technology)
- M.Sc. (Aquaculture)
- B.Sc. (Inland Fisheries, Marine Fisheries, Fish Processing Technology)
- Diploma (Fishculture, Fish Preservation)

Institution structure

The IFDR comprises the following sections:

- Aquaculture
- Marine Fisheries
- Inland Fisheries
- Fish Processing Technology
- Fishery Socio-economics

Staff

Professional scientific staff:

Name	Degree	Speciality
Abalos, T.A.		
Agbayani, R.		
Aure, R.C.		
Banacia, G.T.		
Banasihan, E. (Ms)		
Bigueras, L. (Ms)		
Canlas, Jr. J.R.		
Cinco, E.L.		
Domingo, G.		
Dureza, L. (Ms)		
Dureza, V.		
Enderez, E.M.		
Espejo-Hermes, J.M.		
Evangelista, G.M.		
Hernando, A.M.		
Ingles, J.		
Lapitan, R. (Ms)		
Laureta, L.V.		
Manalo, T. (Ms)		
Nava Luna, N.		
Querido, C. (Ms)		
Reyes, E. (Ms)		
Saclauso, C.		
Ventura, R.		

Information facilities

Monographs and serials titles:
- Inland Fisheries Project, Technical Report (1-8)

Research craft

Name: M/V ALBACORE
Owner: College of Fisheries
Length: 32 m.
Crew: 19
Scientists: 17
Special facilities:
Trawl winch, long-line hauler, oceanographic winch, compass, different fishing gears, electronic equipment

Name: M/V SARDINELLA
Owner: College of Fisheries
Length: 40 m.
Crew: 19
Scientists: 21
Special facilities:
Trawl winch, long-line hauler, oceanographic winch, compass, different fishing gears, electronic equipment

Institution code: 000014 Information received: 13/04/81

Kawanihan Ng Pangisdaan at Yamang Dagat (KPYD)

(Bureau of Fisheries and Aquatic Resources (BFAR))

Executive officer GONZALES, Felix R.: Director

Postal Address

Kawanihan Ng Pangisdaan at Yamang Dagat (KPYD)
860 Arcadia Building, Quezon Avenue
P.O. Box 623
3008 QUEZON CITY-METRO MANILA

Telephone: 965428/988574/965498
Telex: 2566
Cable: BFAR PU

Working languages
English

Nature of institute
Governmental Academic Private (non-profit)

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Inland Fisheries
Resources Management	Fishing Technology
Food Sciences / Food Technology	Quality Control (fishery Products)
Aquaculture	Oceanography
Limnology	Offshore Technology
Microbiology	Pollution
Engineering	Policy and Planning
Mutual Assistance / Technology Transfer	Marketing / Economics
Computer / Information Systems	Education, Training or Extension

Areas of speciality

Marine Mammals	Demersal Fish
Pelagic Fish	Other Vertebrates
Cephalopods	Lobsters
Shrimps / Prawns	Other Invertebrates
Micro-organisms	Plankton
Benthos	Offshore Marine Waters
Coastal Marine Waters	Brackish Waters
Inland (Fresh) Waters	Mangroves Ecosystems
Coral Ecosystems	Nutrients

Objectives and programmes

History of institution, its mandate and purpose

The present Bureau of Fisheries and Aquatic Resources (BFAR) started in 1907 as Division of Fisheries in the Bureau of Science. With the Fisheries Act No. 4003 the promotion and development of Philippine fishery industry was made possible. Later on the Division has undergone various transformation and developmental reorganizations and by Presidential Decree No. 461 of 17 May 1974 the BFAR has been established under the Ministry of Natural Resources (MNR). The BFAR is the governmental agency responsible for the development, improvement, management and conservation of the country's fisheries and aquatic resources.

Research, monitoring and other activities in the last three years

Under the BFAR Research Program, an average of 37 applied research projects were conducted from 1980 to 1982, coming from various aspects of inland, commercial and municipal fisheries sectors, fishery product utilization, conservation and law enforcement. Other activities were on livelihood programs, fingerling production and dispersal, sea farming, fisheries extension services program, fisheries training program, national bangus breeding program and law enforcement and conservation.

Major current research and other activities

Researches that were conducted include those on aquaculture, municipal and commercial fisheries, fish and fishery product utilization and conservation. Results would provide field tested technology for dissemination to the industry through the fisheries extension program and likewise be the basis for rational management of fisheries resources. Every year the research program of the Bureau is reviewed and approved by the Philippine Council of Aquaculture and Resources Research and Development (PCARRD). For 1983, 33 applied research projects are conducted, notable of which were the resource assessment and oceanographic investigations. Other activities were the same as under Research, monitoring, and other activities in the last three years.

Future programmes

Continuation of current programme
- with emphasis on aquaculture management and development of coastal and marine areas including EEZ waters

Objectives and programmes (Cont.)

Cooperative programme

BFAR, being the implementing arm of the integrated fisheries development plan of the Philippines, has to coordinate with agencies (both public and private) which are directly and indirectrly involved in fisheries activities. In addition, tie-ups with other local and foreign entities are also instrumental in the development of the fisheries industry of the country.

- Local Coordination involves cooperation with 62 organizations
- Foreign Coordination involves cooperation with 26 foreign and international organization among them ASEAN, CIDA, FAO, UNDP, WB etc

Training programme

Fishermen's Training Centre (Sangley Point, Cairte City) and seven regional Fishermen's Training Centers located in different provincial areas. Four Brackishwater Aquaculture Training Centers (Paombong, Bulacan; Pagbilao, Quezon; Calape, Bohol and Lala, Lanao del Norte) and one Freshwater Fish Hatchery and Extension Center (Muñoz, Nueva Ecija).

The Training is undertaken for masterfishermen, skippers, engineers and fish farmers in commercial fisheries, fish farm management and post harvest, fishpond engineering and construction, fish farmer economics and fish farm extension and methodology, as well as in fish handling processing, fish conservation and law enforcement.

Institution structure

- Director (Assistant Director for Conservation, Assistant Director for Research and Development)
- Technical Divisions (Conservation and Law Enforcement, Fisheries Licences, Fishery Economics and Information, Fisheries Utilization, Fish Propagation, Fisheries Research, Fisheries Extension, Fisheries Engineering and Technological Services)
- Non-technical Divisions (5)
- Regional Offices (13) with the respective fishery stations
- Provincial Offices
- Fishfarm Nursery and Hatchery Stations
- Training Centres

Staff

49 Professional staff 1975 Technical staff 1340 Other staff

Professional scientific staff:

Name	Degree	Speciality
Felix R. Gonzales	M.S.(Fishery tech.)	Fish processing, Fisheries planning, Management administration
Simeona Aypa	M.S.(Aquaculture)	Aquaculture
Ricardo Lim	M.S.(Aquaculture)	Aquaculture
Melchor Tayamen	M.S.(Aquaculture)	Aquaculture
Flerida Arce	M.S.(Marine Biology	Marine biology
Jose Ordoñez	M.S.(Marine Biology	Marine biology
Reuben Estudillo	M.S.(Marine Biology	Marine biology
Ethel Llana	M.S.(Marine Biology	Marine biology
Natividad Lagua	M.A.(Public Adm.)	Planning research, Project evaluation
Anselma Legaspi	M.A.(Public Adm.)	Fisheries extension, Fish processing, Public administration
Antonio Avisado	M.A.(Public Adm.)	Public administration
Aurora Reyes	M.A.(Management)	Planning and management
Pablo Tamesis	M.A.(Educ. Admin.)	Training
Pilar F. Fontellar	M.S.(Agriculture)	Wildlife science, Fishery science
Nelson Lopez	M.S.(Aquaculture)	Aquaculture
Cecilia Reyes	M.S.(Agri. Econ.)	Agricultural economics
Jose Natividad	M.S.(Agriculture)	Hatchery management
Westly Rosario	M.S.(Agriculture)	Hatchery management
Andrea Bloom	M.A.(Public Admin.)	Public admin. management Research
Inocencio Ronquillo	M.A.(Marine Biology	Fisheries biology
Narciso Lijeralde	M.A.(Public Admin.)	Construction fishing gears

Premises/facilities

Laboratory area: 491 m²

With facilities for:
Visiting Scientists: 3 Students: 10

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 60
Number of periodical subscriptions:35

Information facilities (Cont.)
Monographs and serials titles:
- General Information Series (Regular)
- Technical Paper Series (Regular)
- Fisheries Newsletters (Quarterly)
- Philippine Journal of Fisheries (Semi-Annual)
- Fisheries Statistics of the Philippines (Annually)
- Annual Reports (Annually)

Equipment
Microkjeldahl, distillation apparatus, plankton apparatus, tripod stand, balance (triple beam), balance (analytical), can sealer, cooking meter, dessicator, dissolved oxygen meter, ejector, harmocynometer, salinity meter, illuminator, incubator, oxygen test kit, machine sealing, microscope, pH meter, photo micrograph, planimeter, pressure cooker, stereomicroscope, thermometer, Torry meter, tripod telescopic stand, air compressor, autoclave (electric), echo (fish) sounder, Eheim power filter, generator, grinder bench, grinder corn mill, mixer (electric) centrifugal pump

Aquarium facilities
Number of tanks: 110

Organisms maintained:
Demersal Fish Pelagic Fish Other Vertebrates
Other Invertebrates

Species maintained for experimental purposes:

Scylla serrata	*Penaeus monodon*	*Metapenaeus sp.*
Tilapia nilotica	*Ophicephalus striatus*	*Clarias macrocephalus*
Serranidae	*Siganus sp.*	*Anguilla sp.*
Radiantus sp.	*Rhincanthus rectangulus*	*Gymnothorax tesselata*
Myripristis adustus	*Paracanthurus hepatus*	*Chaetodon octofasciatus*
Forcipiger longirostris	*Lo (Siganus) vulpinus*	*Chromis coeruleus*
Plectorhynchus chaetodon.	*Plerois volitan*	*Chelman rostratus*
Zanclus cornutus	*Rhinecanthus aculeatus*	*Amphriprion ephippium*
Helostoma temmiciki	*Metynnis schreitmuelleri*	*Xiphophorous nellerii*
Astronotus acellatus	*Labeo bicolor*	*Lebistes reticulatus*

Research craft
Name: R/V RESEARCHER
Length: 45 m.
Type: Research vessel
Date of construction: 1966
Crew: 32
Scientists: 6
Lab. space: 10 m2
Special facilities:
Echosounder, sonar, minitrawl eye, satellite navigator.

Name: M/V MALASUGUI
Length: 31 m.
Type: Survey vessel
Date of construction: 1960
Crew: 26
Special facilities:
Trawl and tuna longline, radio direction finder, marine radar, fish finder.

Name: M/V SABALO
Length: 28 m.
Type: Survey vessel
Date of construction: 1966
Crew: 20
Special facilities:
Sardine purseine, radio direction finder, marine radar, fish finder

Name: M/V LAPU/LAPU
Length: 28 m.
Type: Survey vessel
Date of construction: 1966
Crew: 24
Special facilities:
Trawl, radio direction finder, marine radar, fish finder.

Name: RPS ALBACORA
Length: 47 m.
Type: Survey vessel
Date of construction: 1974
Crew: 24
Special facilities:
Fish carrier and tuna longline

Research craft (Cont.)

Name: RPS LUMBA-LUMPA
Length: 47 m.
Type: Survey vessel
Date of construction: 1974
Crew: 18
Special facilities:
Fish carrier and tuna longline.

Name: F/V HASA/HASA
Length: 16 m.
Type: Survey vessel
Date of construction: 1967
Crew: 14
Special facilities:
Bottom trawl, pole and line.

Name: F/V MAYA-MAYA
Length: 29 m.
Type: Survey vessel
Date of construction: 1967
Crew: 22
Special facilities:
Sardine purseine and trawl.

Institution code: 000015 Information received: 09/12/83

University of the Philippines, Marine Sciences Center (UPMSC)

Executive officer GOMEZ, Edgardo D.: Director

Postal Address

University of the Philippines, Marine Sciences Center (UPMSC)
U.P. I
DILIMAN - QUEZON CITY 3004

Telephone: 989742/976061
Cable: UPMARSCI MANILA

Working languages
English, Pilipino

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Resources Management
Aquaculture
Oceanography
Limnology
Chemical Sciences
Microbiology
Pollution
Education, Training or Extension

Areas of speciality
Demersal Fish
Lobsters
Other Invertebrates
Algae
Micro-organisms
Plankton
Benthos
Other Mineral
Coastal Marine Waters
Brackish Waters
Mangroves Ecosystems
Coral Ecosystems
Petroleum Hydrocarbons
Nutrients

Objectives and programmes

History of institution, its mandate and purpose

In February 1975, the MSC secretariat commenced operations at the Natural Science Research Center building, and by April the first projects of the Center were begun. The wide scope of the functions which the Center is expected to perform is reflected in the objectives set down in its Charter. Accordingly the Center is to conduct research on the 'development, utilization, and conservation of the marine resources of the country'.

Research, monitoring and other activities in the last three years

During the last 3 years the Center has completed 25 projects while 34 are in progress in the following areas: algae (taxonomy, culture, and chemistry of algal extracts) and invertebrates, assessment of coral resources and taxonomic studies on shore fishes. Although much of the work undertaken was basic research, the projects were designed to contribute to the formulation of efficient exploitation techniques and improved artificial propagation methods for important marine products, and search for novel uses for otherwise unexploited resources.

Major current research and other activities

- Monitoring of coral reefs (E.D. Gomez)
- Ecological and biological studies on spiny lobsters (E.D. Gomez)
- Larval and juvenile biology of *Portunus pelagicus*(E.G. Olympia)
- Reproductive cycle of *Diadema setosum* (E.D. Gomez)
- Seaweed processing technology (E.C. Laserna)
- Seaweeds *Sargassum* sp. as a source of biogas (E.C. Laserna)
- Prepilot studies on alkaloids from med. plants (E.C. Laserna)
- Physico-chemical studies of marine algal polysaccharides (E.C. Laserna)
- Chemistry of marine natural products (G.B. Cajipe)
- Fish toxicants from mangrove plants (G.B. Cajipe)
- Ecology and chemistry of the Philippine soft coral (G.B. Cajipe)
- Biochemical genetic studies of Philippine siganids (J. Macaranas)
- Immunological investigation of Philippine siganids (J. Macaranas)
- Species identification and classification of fishes and other aquatic products through classical and other characterization techniques (J. Macaranas)
- Collaborative project between SEAFDEC and U.P. MSC on genetic variation in milkfish (J. Macaranas)
- Taxonomy of Philippine porifera (Marine Sponges) (M.D. Lopez)
- Mangrove fishes of Pagbilao, Quezon with notes on their seasonality and abundance (R.M. de la Paz)
- Biomass production, nutrient cycling and energy flow in a mangrove forest exosystem at Pagbilao, Quezon (M.D.Fortes, L. Pinto)
- Ecological assessment and cultivation of seagrasses in Bolinao Bay for biomass production (M.D. Fortes)
- Taxonomy and production ecology of Philippine seagrasses (M.D. Fortes)
- The G.T. Velasquez phycological herbarium (G.C. Trono, Jr.)
- Development of production technology for *Acanthopora spicifera* (G.C. Trono, Jr.)
- Seaweed and invertebrate resources of Lingayen Gulf

Objectives and programmes (Cont.)

(G.C. Trono, Jr.)

- Management studies on the natural stocks of *Gracilaria* sp. (G.C .Trono, Jr.)
- Studies on the relationship between age and amount of recoverable carageenin in *Eucheuma* (G.C. Trono, Jr.)
- Environmental studies in Tabangao, Batangas (G.C. Trono, Jr.)
- Establishment and maintenance of a type culture collection of marine bacteria, fungi and yeasts (F.R. Uyenco, L. Saniel)
- Enzymes in *Conus* venoms (M. Bautista Leano, A Reyes, L. Cruz)
- The reproductive biology and ecology of agarophyte *Gelidiella acerosa* (E.G. Fortes)
- Study on the behavior, growth and feeding habits of Philippine commercial *Holothuria* (L. Leonardo)
- Studies on the natural recolonization of damaged reefs, and their rehabilitation by coral transplantation (H.T. Yap)
- Product formulation utilizing seaweeds and seaweed extracts in horticulture (N.E. Montano)
- Primary productivity and natural stocks in relation to oyster biology (G.S. Jacinto)

Future programmes

With the construction of the Marine Sciences Center's laboratories, studies in marine geology and chemistry, physical oceanography and other fields related to the marine environment will be feasible. It is difficult to further specify long-range research programmes at present since this is subject to the availability of personnel and funding.

Cooperative programme

The Center has established linkages and working relations with various international and local institutions. Two projects are jointly undertaken with the International Center for Living Aquatic Resources Management (ICLARM) and with Mississippi State University through the National Science Foundation (USA), East Asia Science Cooperation Program with our National Science and Technology Authority. The Center is also involved in the implementation of the UNEP Regional Seas Programme for East Asia. Also, it has a joint project with the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC). Collaborative projects are also undertaken with various local institutions on Luzon and in the Visayas, including Silliman University, the University of San Carlo, the Bureau of Fisheries and Aquatic Resources, and the Natural Resources Management Center.
Within the University of the Philippines System, research projects have been undertaken in collaboration with the U.P. Diliman C.A.S., the U.P. Manila College of Medicine, and the U.P. Manila C.A.S.
The Marine Sciences Center is also represented in various national and international committees and organizations: Unesco Coral Reef Programme (COMAR), Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), International Union for the Conservation of Nature and Natural Resources (IUCN), International Union of Biological Sciences (IUBS), International Association of Biological Oceanographers (IABO), Pacific Science Association Scientific Committee on Coral Reefs, Philippine Council for Agriculture and Resources Research and Development (PCARRD), National Committee on Marine Sciences (NCMS), National Mangrove Committee, Task Force Pawikan Council, Coastal Zone Management Program (NEPC), and Marine Parks Task Force.

Training programme

No teaching program of its own. However, the part-time staff of the Center are engaged by the University to handle graduate and undergraduate courses in their respective fields. Workshops and non-degree training courses are also offered by the Center occasionally. There is a proposal to transform the Center into an institute that will integrate its research functions with the curricular programs of various departments of the College of Science in the marine sciences.

Institution structure

The Marine Sciences Center is attached to the College of Arts and Sciences. The policy-making body of the Marine Sciences Center is the Advisory Executive Council which is composed of ten members from various scientific disciplines. The Director carries out the policies and programs of the Center, and is directly responsible to the Council. The Center is not yet divided into distinct departments or research units.

Staff

30 Professional staff 31 Technical staff 13 Other staff

Staff **(Cont.)**

Professional scientific staff:

Name	Degree	Speciality
Gomez, Edgardo	Ph.D.	Marine biology
Cajipe, Gloria	Ph.D.	Organic chemistry
Trono, Gavino	Ph.D.	Marine ecology, Phycology
Alcala, Angel	Ph.D.	Marine biology
Benitez, Lita	Ph.D.	Biochemistry
Cruz, Lourdes	Ph.D.	Biochemistry
Uyenco, Flordeliz	Ph.D.	Microbiology
Velasquez, Gregorio	Ph.D.	Physiology
Laserna, Evelina	M.Sc.	Bio-organic chemistry, Physical organic chemistry
Macaranas, Julie	M.Sc.	Biochemistry
Montaño, Nemesio	M.Sc.	Chemistry
Fortes, Edna	M.Sc.	Marine biology
Jacinto, Gil	M.Sc.	Oceanography
Lopez, Mai Davide	M.Sc.	Marine biology
Molina, Francis	M.Sc.	Botany
Yap, Ma. Helena	M.Sc.	Marine biology
Aliño, Porfirio	M.Sc.	Marine biology
Barza, Lourdes	M.Sc.	Biology
Cardano, Myrna	M.Sc.	Botany
Follosco, Minda	M.Sc.	Botany
Put, Ong Ang, Jr.	M.Sc.	Marine biology
Bautista-Leano, Milagros	M.Sc.	Chemistry
Fortes, Miguel	M.Sc.	Botany
Leonardo, Lydia	M.Sc.	Marine biology
Reyes, Angelita	M.Sc.	Biochemistry
Saniel, Luisa	M.Sc.	Botany
Olympia, Emmanuel	M.Sc.	Marine biology
Veroy, Reynita	B.Sc.	Chemistry
Luistro, Andrea	B.Sc.	Chemistry
Dela Paz, Reynaldo	D.Sc.	Ichthyology

Premises/facilities

Building area: 1200 m² Laboratory area: 1000 m²

Equipment

Stereomicroscopes, compound microscopes, thermograph, automatic tissue processor, photometer, camera system, pH meter, incubator, SCUBA diving equipment, compressor, infra-red spectrometer, UV-visible spectrometer, atomic absorption spectrometer, freeze dryer, rotary microtome, salinometer, fluorescence spectrometer, D.O. meter, LKB Multiphor electrophoresis, high-speed refrigerated centrifuge, Hi-performance dispenser (homogenizer), circulation bath, bio-incubator, various ovens and analytical balances, high pressure liquid chromatograph, field vehicle (Land Rover).

Aquarium facilities

Number of tanks: 40

Organisms maintained:

Demersal Fish	Crustaceans	Other Invertebrates
Algae	Micro-organisms	

Species maintained for experimental purposes:

Acanthophora spicifera	*Holothuria spp.*	*Actinopyga spp.*
Panulirus spp.	*Portunus sp.*	*Chanos chanos*
Tilapia spp.		

Research craft

Name: NONE
Owner: UPMSC
Type: rubber boat

Name: NONE
Owner: UPMSC
Length: 3 m.
Type: fiber glass dinghy

Institution code: 000016 Information received: 19/10/83

Pambansang Komisyon sa Pagsugpo sa Polusyon

(National Pollution Control Commission (NPCC))

Executive officer PECACHE, Guillermo A.: Commissioner

Postal Address

Pambansang Komisyon sa Pagsugpo sa Polusyon
727, Pedro Gil Street
P.O. Box 2801
ERMITA, MANILA

Telephone: 508508

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities
Ecological Sciences
Microbiology
Pollution

Areas of speciality
Offshore Marine Waters
Coastal Marine Waters
Brackish Waters
Inland (Fresh) Waters

Objectives and programmes

History of institution, its mandate and purpose

The Commission was created in 1964 by virtue of Republic Act No. 3931 and was entrusted with the role of implementing government regulations on environmental control. It undertakes activities which involve the identification of the industrial sources of environmental pollution; surveys and investigations of pollution complaints; review and approval of plans for pollution control facilities and monitoring of pollution trends in the country.

Research, monitoring and other activities in the last three years

Research on chlorinated pesticides and heavy metal residues in freshwater and marine food fishes; threshold limits and effects of sulfur dioxide on plants and heavy metal composition of particular matter in the atmosphere.

Regular water quality monitoring in rivers of Metro Manila to check their physical and chemical characteristics. Important parameters determined are dissolved oxygen, biochemical oxygen demand, total solids, pesticides, mercury and heavy metals, oil and greases, phenols and detergents and coliform organisms.

Air quality monitoring in Metro Manila with the aid of air sampling stations equiped with automated instruments which record continuously the hourly concentrations of suspended particulates, carbon monoxide, sulfur dioxide, oxides of nitrogen and oxidants.

Major current research and other activities

Same as in the last three years

- and the Manila Bay monitoring programme which is composed of five (5) components including bathing beaches water quality monitoring in Eastern Manila Bay, offshore water quality monitoring, benthic fauna transects, trace metals and pesticides in indicator fish and accumulation of trace metals in sediments.

Future programmes

A program is being initiated for a more extensive monitoring in coastal waters of the industrialized cities of the Philippine Archipelago which includes five (5) coastal cities (Manila, Cebu, Iligan, Davao and Cagayan de Oro).

Cooperative programme

- Environmental Protection Agency, United States (Inter-Laboratory Quality Assurance Exercises)
- Global Environmental Monitoring System, WHO (Study on the Concentration of Sulfur Dioxide in the Ambient Atmosphere)
- Metropolitan Waterworks and Sewerage System (Manila Bay Monitoring Programme)
- National Environmental Protection Council-National Institute of Science and Technology (Project on Sulfur Content of Moss and Lichens)
- Man in the Biosphere (MAB) - (Monitoring of Muelle in Varadero Bays in Puerto Galera, Oriental Mindoro)

Training programme

Research and Development Division provides laboratory training to chemists and other allied professions on the physical, chemical, bacteriological, pesticides and heavy metal analysis of water and wastewater sample as well as on the analysis of pollutants in air including the use of sophisticated instruments for pollution monitoring activities.

Institution structure
The Commission is divided into the following offices:
- Office of the Commissioner
- Office of Deputy Commissioner for Standard Setting and Monitoring
- Office of Deputy Commissioner for Enforcement
- Research and Development Division
- Water Pollution Control Division
- Air Pollution Control Division
- Legal Division
- Administrative Division
- Planning and Statistics Division
- Finance Division
- Motor Vehicle Pollution Control Division

Staff
27 Professional staff 105 Technical staff 93 Other staff

Professional scientific staff:

Name	Degree	Speciality
De Leon, Honorata R.	M.Sc.	Environmental monitoring, Environmental management, Pollution control technologies
Ramallosa, Luzviminda V.	B.Sc.	Wastewater analysis
Bugajong, Beatriz	B.Sc.	Wastewater analysis
Gonzales, Erlinda A.	B.Sc.	Pesticide residues in water, Biological samples
Panganiban, Marietta V.	B.Sc.	Biological samples, Heavy metals in water,
Abergas, Teresita Y.	B.Sc.	Heavy metals/air pollution
Tinoko, Nenita L.	B.Sc.	Wastewater analysis
Capino, Ma. Consolacion N.	B.Sc.	Wastewater analysis
Baetiong, Leonita D.	B.Sc.	Bacteriological analysis
Torres, Wilma H.	B.Sc.	Bacteriological analysis

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 228
Number of periodical subscriptions:9

Monographs and serials titles:
- Annual Reports, 1981, 1982, 1983

Equipment
Atomic absorption spectrophotometers (2), gas chromatograph, UV spectrophotometer, selective ion meter, oxygen meter, BOD incubators (2), bacteriological incubators (3), drying ovens (5), deep freezers (3), analytical balances (5), microscopes (5), centrifuges (3), pH meters (2), turbidimeters (2).

Institution code: 000017 Information received: 14/07/83

Komisyon ng Lakas Atomika ng Pilipinas

(Philippine Atomic Energy Commission (PAEC))

Executive officer EUGINIO, Manuel R.: Commissioner

Postal Address

Komisyon ng Lakas Atomika ng Pilipinas
Don Mariano Marcos Avenue
P.O. Box 932 MANILA
DILIMAN - QUEZON CITY

Telephone: 976011-15
Telex: 66-804
Cable: PHILATOMIC

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities
Biological Sciences
Food Sciences / Food Technology
Physical Sciences
Engineering
Mineral Resources (incl. Oil)
Education, Training or Extension
Ecological Sciences
Chemical Sciences
Pollution
Geology (incl. Sedimentology)
Computer / Information Systems

Areas of speciality
Demersal Fish
Algae
Thermal
Metals
Radionuclides
Pelagic Fish
Other Mineral
Coastal Marine Waters
Halogenated Hydrocarbons

Objectives and programmes

History of institution, its mandate and purpose

The Philippine Atomic Energy Commission was organized in 1958 under the National Science Development Board (NSDB) and was transferred to the Office of the President in July 1974, bearing the same name. On October 6, 1977 it was placed under the Ministry of Energy to return to the Office of the President on August 15, 1980. On July 1981, it was placed under the Office of the Prime Minister and 17 March 1982 it was transferred to the National Science and Technology Authority. The Commission performs oriented and unrestricted research in marine radioactivity, as well as in other environmental areas. Non-environmental research in chemistry, physics, health physics, mathematics, agriculture, biology and medicine are also undertaken. The main functions of the Commission are nuclear research and regulation. Other important functions are nuclear service, nuclear technology applications and nuclear training.

Research, monitoring and other activities in the last three years

The Analytical Services Division has completed the project on the determination of toxic metals in fish in connection with the NSDB/PAEC project on 'Toxic Heavy Metal Levels in Philippine Fish and Other Sea Foods.' Also completed were the projects on surface labelling of bedload sediments and environmental sampling and analysis for boron, arsenic and mercury in the Leyte Geothermal Project. Effects of siltation in the coastal area of San Fabian and baseline studies on radioactivity in food items common to Filipino diet, were likewise completed.

Major current research and other activities

Natural radioactivity measurements including radionuclid contamination in marine and aquatic ecosystems as well as baseline radioactivity in food items common to the Filipino diet, including fish, are presently being conducted. Other pollution studies include the analysis of pesticide residues in marine resources and of poly-chlorinated biphenyls and benzopyrenes in air and water. Environmental sampling and analysis of radioactive emissions from non-nuclear power plants including fossil fired, geothermal and coal fired plants in the Philippines is being undertaken for a comparative study with nuclear power plant emissions. Audit of environmental, particularly radiological, impact studies and baseline measurements for the first Philippine Nuclear Power Plant (PNPP-1) especially in the receiving waters around Napot Point in Bataan is continuing. Data from the baseline studies will be used in monitoring any future significant increase in background radioactivity due to the operation of nuclear power plant and other nuclear facilities, nuclear weapon testing and nuclear detonation. The search for potential biological indicators of radiation effects in biota surrounding this plant is also being undertaken. Radioactive waste disposal into aquatic systems and the uptake of radionuclides by specific marine biota and other commonly eaten water

Objectives and programmes (Cont.)

crops has been started. Analytical techniques for the determi-nation of different chemical moities that may be discharged into the marine environment by the nuclear plant is under development. Several environmental projects are being undertaken by other institutions funded by PAEC grants-in-aid. Included in these are the study on the effects of tritium and hyperthermia in bangus (*Chanos chanos*) fry.

Future programmes

The on-going investigations, many of them started in 1980, will continue and intensify, especially those connected with the environmental surveillance around the first Philippine nuclear power. Additional studies in geothermal plant areas especially re-injection studies are programmed for further study.

Monitoring studies will continue with emphasis on the perfection of analytical techniques to detect trace elements and other component in marine pollution studies. Audit of the PNPP-1 surveillance and baseline measurement program will continue to assure the satisfactory completion of the pre-operational monitoring program for the PNPP-1. Identification of the critical group aound PNPP-1 and modelling of the radionuclide pathway in the plume exposure pathway zone will be undertaken.

Cooperative programme

The PAEC has cooperative research programmes with the National Environmental Protection Council, the Bureau of Fish and Aquatic Resources and several other Philippine governmental agencies. Some of its environmental research is part of IAEA coordinated programme

Training programme

The Commission conducts courses in basic radioisotope techniques and radiation protection for professionals and member of faculties of schools and universities. It also offers specialized courses in nuclear power medicine, industrial uses and other related applications of atomic energy.

Institution structure

- Office of the Commissioner and Deputy Commissioner
- Management Service (4 divisions and 1 unit)
- Atomic Research Center (5 divisions)
- Department of Nuclear Technology and Engineering (4 divisions)
- Administrative Service (3 divisions)
- Department of Nuclear Services (4 divisions)
- Department of Nuclear Regulations and Safeguards (4 divisions)
- Department of Nuclear Training (1 institute and 1 division)

Staff

61 Professional staff 225 Technical staff 140 Other staff

Professional scientific staff:

Name	Degree	Speciality
Aleta, C.R.	Ph.D.	Nuclear engineering
Ballelos, E.D. (Ms)	Ph.D.	Radiation biology, Biophysics
Bautista, E.R.B.	Ph.D.	Nuclear chemistry
Bernido, C. (Ms)	Ph.D.	Nuclear chemistry
Dela Rosa, A. (Ms)	Ph.D.	Biochemistry
Eugenio, M.R.	Ph.D.	Nuclear engineering
Manoto, E.C.	Ph.D.	Entomology
Medina, F.I.	Ph.D.	Animal science
Navarro, Q.O.	Ph.D.	Nuclear chemistry, Solid state physics
Palabrica, R.J.	D.Sc.	Nuclear engineering
Refre, A.E.	Ph.D.	Applied science
Santos, I.S.	Ph.D.	Plant breeding, genetics
Valencia, I.G.	Ph.D.	Soil science
Alejandrino, A.L. (Ms)	M.Sc.	Biochemistry
Asprer, G.A. (Ms)	M.Sc.	Environmental science
Asuncion, A.	M.Sc.	Agriculture
Bernardo, B.C.	M.Sc.	Sanitary engineering
Blanco, L.	M.Sc.	Biology
Bonuel, V. (Ms)	M.A.T.	Physics
Cabalfin, E. (Ms)	M.Sc.	Nuclear technology
Cabalfin, E.	M.Sc.	Applied chemistry, Physics
Calix, V.M.	M.Sc.	Physics
Corpuz, G.C.	M.Sc.	Reactor physics
De Jesus, E.M. (Ms)	M.Sc.	Chemistry
Dela Paz, L.R. (Ms)	M.Sc.	Statistics
Demondon, D.B.	M.Sc.	Nuclear engineering
Elec, J.	M.Sc.	Botany
Eugenio, A.D. (Ms)	M.Sc.	Inorganic nuclear chemistry
Gopez, A.C.	M.Sc.	Chemistry
Gregorio, J.S. (Ms)	M.Sc.	Biology
Hernandez, E.	M.Sc.	Geology

Staff (Cont.)

Name	Degree	Speciality
Kapauan, P.S. (Ms)	M.Sc.	Chemistry
Leopando, L.L. (Ms)	M.Sc.	Physical chemistry
Leopando, L.	M.Sc.	Nuclear engineering
Lugtu, MA. C.P. (Ms)	M.Sc.	Radiopharmacy
Lapade, A.	M.Sc.	Botany (Genetics)
Natera, E.S. (Ms)	M.Sc.	Radiation biology
Pabelonia, C.	M.Sc.	Engineering, Engineering education
Payongayong, A. (Ms)	M.Sc.	Physics
Panlaque, C. (Ms)	M.Sc.	Biology (Cytogenetics)
Palabrica, O.T. (Ms)	M.Sc.	Chemistry
Petrache, C.A. (Ms)	M.Sc.	Nuclear engineering
Roceles, P.C. (Ms)	M.Sc.	Chemistry
Rodriquez, P. (Ms)	M.Sc.	Nuclear engineering
Santos, F. (Ms)	M.Sc.	Organic chemistry
Singson, C.C. (Ms)	M.Sc.	Biochemistry
Yoshisaki, M.B.	M.Sc.	Nuclear engineering
Yulo, M.T.	M.Sc.	Biochemistry
Paredes, C.H.	M.Sc.	Bionucleonics

Premises/facilities
Building area: 8375 m² Laboratory area: 2050 m²
With facilities for:
Visiting Scientists: 15 Students: 20

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 4060
Number of periodical subscriptions:98

Equipment
Ge-Li detectors, NaI detectors, alpha counters, beta counters, silicon-surface barrier detector, liquid scintillation counters, gas chromatographs, atomic absorption spectrometer, pulse polarographic spectrometer, multichannel analyzers, PDP 8/3 computer with automatic digital scanner, ultraviolet-visible spectrophotometers, photomicroscope III, mass-spectrometer, muffle furnace, TLD reader, radiation dose meters, gas flow proportional counter, scalers, air samplers, disc gel electrophoresis set-up, biological isolation hood, infra-red spectrometer and refrigerated centrifuge, autoclaves fration collector, high performance liquid chromatograph, carbon-hydrogen analyzer, analytical balances, microscopes, ratemeters.

Aquarium facilities
Number of tanks: 13

Organisms maintained:
Marine Mammals Demersal Fish Molluscs
Algae

Institution code: 000018 Information received: 08/08/83

National Operations Center for Oil Pollution (NOCOP)

Executive officer EVANGELISTA, Quirico V., Jr.: Commander

Postal Address

National Operations Center for Oil Pollution (NOCOP)
Muelle Dela Industria, Farola Compound, Binondo
MANILA

Telephone: 470690

Working languages
Pilipino, English

Nature of institute
Governmental

Main fields of activities

Oceanography	Pollution

Areas of speciality

Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Petroleum Hydrocarbons
Metals	Halogenated Hydrocarbons

Objectives and programmes

History of institution, its mandate and purpose

The National Operations Center for Oil Pollution (NOCOP), a specialized service of the Philippine Coast Guard, was established on July 16, 1975 in Manila pursuant to Presidential Decree No. 602. The mission of the Center is to prevent, control and mitigate marine pollution caused by dumping of wastes and spillage of oil and other noxious substances within the territorial and economic zones of the Philippines.

Research activities are limited on physical and chemical oceanography in coordination with other government agencies.

Research, monitoring and other activities in the last three years
- Manufacture of bamboo boom barrier
- Construction of oil-water separator/reception facility
- Study of the physical characteristics of Manila Bay in coordination with Bureau of Coast and Geodetic Survey

Major current research and other activities
- Monitoring of oil pollution in Manila Bay area and other major ports/harbours
- Study on the toxicity of oil and oil dispersants in tropical and sub-tropical species
- Accreditation of oil dispersants, oil/water separators and other oil spill equipment for use in the Philippines

Future programmes
- Joint exercise of the National Contingency Plan for oil spill incidents
- Requisition of additional oil spill response equipment

Cooperative programme
- National Environmental Protection Council (effects of oil spills, pollution control technology, coastal zone management)
- ASEAN expert group on marine pollution (data bank on pollution from ships, training on monitoring and combating pollution etc.)
- IMO (development of sub-regional oil spill contingency arrangements)

Training programme

Training programme (marine environment protection) is conducted for coast guard personnel in selected cities and municipalities.

Institution structure

The Center has the following sections:
- Legal
- Laboratory
- Operations
- Supply
- Administrative

Furthermore there are also 4 detachments in different localities of the country.

Staff

Professional scientific staff:

Name	Degree	Speciality
Araw F. Bernabe PN, Capt.	M.Sc.	Environmental science
Julito M. Casillan II PN, Cdr	Ph.D.	Public administration
Quirico V. Evangelista Jr. PN	M.Sc.	Meteorology
Amable B. Tolentino PN, Lt.	B.Sc.	
Ernesto J. Paquiz PN, Lt.	B.Sc.	Mechanical engineering
Edgardo L. Mandapat PN, Ltjg.	B.Sc.	Industrial engineering
Isidro T. Velasco PN, Ltjg.	B.Sc.	Chemical engineering

Staff (Cont.)

Name	Degree	Speciality
Edwin Sm Talens, Ens.	B.Sc.	
Dolora A. Delos Santos (Ms)	M.Sc.	Chemistry

Premises/facilities
Building area: 200 m² Laboratory area: 8 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 50

Equipment
Infrared spectrophotometer, gas chromatograph, atomic absorption spectrophotometer, oil content analyzers, pH- meter, analytical balance and drying oven, two wherries (light boats, 5m).

Aquarium facilities
Total area: 6 m² Number of tanks: 12

Institution code: 000019 Information received: 14/06/83

Kawanihan ng Pagsukat sa Baybayin at Kalupaan (KPBK)

(Bureau of Coast and Geodetic Survey (BCGS))

Executive officer VENTURA, Antonio P.: Director

Postal Address

Kawanihan ng Pagsukat sa Baybayin at Kalupaan (KPBK)
421 Barraca Street
P.O. Box 1620
SAN NICOLAS-MANILA

Telephone: 479611-14/475645
Telex: RCA 722-7373 CGS PH

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities
Oceanography — Physical Sciences
Geography

Areas of speciality
Tide / Waves — Wind
Offshore Marine Waters — Coastal Marine Waters

Objectives and programmes

History of institution, its mandate and purpose

The Bureau of Coast and Geodetic Survey had its beginning from a small office known as the Manila Field Station established in 1901 by the US Coast + Geodetic Survey, Washington D.C.. This office undertook land and water surveys of the islands. In 1939 the BCGS was placed under the supervision of the Department of National Defence and the office attained independence from the control of the USC and GS on June 30, 1950.

With the increase in the socio-economic development activities of the country, there was also a progressive growth in the Bureau's activities. Modern ships, equipment and instruments were acquired, training grants abroad were given to qualified personnel, international meetings and conferences were attended, etc. Moreover, the functions of the former Board of Technical Surveys and Maps (BTSM) was absorbed as a consequence of the reorganization of the Executive Branch of the National government in 1973. The BCGS is the agency of the national government enthrusted with the surveying and mapping of the national territory. Its principal objective is the preparation and production of charts and maps essential in economic planning and development, maritime shipping and various engineering works.

Research, monitoring and other activities in the last three years

Major current research and other activities

During the period 1981-1983 the following work was accomplished:

HYDROGRAPHY/OCEANOGRAPHY:
- hydrographic survey of Palicpican and Panima Bay in Ternate, Cavite
- revision survey of Puerto Galera, Oriental Mindoro
- hydrographic survey of Paluan, Occidental Mindoro
- verification of coast pilot notes in Cebu Harbour
- oceanographic survey of Manila Bay
- marine seismic/oceanographic survey of Leyte Gulf and Surigao Strait
- oceanographic survey of Puerto Galera, Oriental Mindoro
- nationwide geomagnetic observation

GEODETIC SURVEY:
- flood control (Metro Manila)
- topographic mapping (Cagayan Valley)
- horizontal and vertical control surveys (Tongonan area nd Ilocos Norte)
- precise level observation (Samar-Leyte area)
- densification of geodetic control (Cagayan Valley)

MAPPING:
- topographic map production (Lamitan, Basilan)
- topographic surveys (Mandane Wharf; Paluan area, Occidental Mindoro)
- topographic mapping (Ilocos norte, Zamboanga del Sur and Metro Manila)

In addition the tidal phenomena were also studied.

Future programmes
- location of photo control points, northern portion of Metro Manila for topographic mapping
- revision survey, reclamation area, Manila Bay
- revision survey of Iloilo Strait and Harbor
- field edit and compilation survey, Ilocos Norte
- establishment of JMR control net for the country

Objectives and programmes (Cont.)
- **hydrographic survey of Verde Island Passage**
- hydrographic survey, West Coast of Palawan
- verification survey, Port San Fernando and Sual Pangasinan
- participation in the Kalayaan Island environmental research and Marine Science Center project
- coastal mapping, Port of Pagadian and Davao
- geophysical observation for Magnetic Epoch, 1985

Training programme
Scholarships abroad and in-house training (apprenticeship)

Institution structure
- Director (Assistant Director)

Divisions:
- Administrative
- Financial and Management
- Planning
- Operations
- Survey Support
- Physical Sciences
- Chart and Map Production
- Special Projects
- Reproduction and Distribution

Staff
108 Professional staff 82 Technical staff 593 Other staff

Professional scientific staff:

Name	Degree	Speciality
Commo. Antonio P. Ventura	BSGE	Oceanography, Hydrography
Capt. Mamerto S. Gler	BSCE-GE	Oceanography, Hydrography
Capt. Leodegario Bundoc	BSCE-GE	Oceanography, Hydrography
Capt. Ananias Batilaran	BSME-GE	Oceanography, Hydrography
Cmdr. Jose del Fiero	BSEE	Oceanography, Hydrography
Lcdr. Manuel Calibo	BSCE	Oceanography, Hydrography
Lcdr. Dante Porneso.	BSME	Oceanography, Hydrography
Lcdr. Renato B. Feir	BSEE	Oceanography, Hydrography
Lcdr. Rodrigo Pascua	BSCE	Oceanography, Hydrography
Lcdr. Jose Galo Isada	MS	Geodesy, Oceanography
Lcdr. Reynaldo Adorador	MS	Photogrammetry, Hydrography
Ponciano Ciceron	BSCE	Cartography, Hydrography
Conrado Santos	BSCE	Geodesy, Oceanography

Premises/facilities
Building area: 1125 m² Laboratory area: 95 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 6000
Number of periodical subscriptions:10

Equipment
Photogrammetric laboratory equipment, magnetic observatory facilities, Doppler positioning equipment, EDM and other surveying equipment and electronic computer.

Research craft

Name: RPS ATYIMBA
Owner: BCGS
Length: 49 m.
Type: Surveying vessel
Date of construction: 1969
Crew: 75
Scientists: 15
Lab. space: 16 m2
Special facilities:
Standard navigational equipment, integrated hydrographic survey system, oceanographic and hydrographic winch, limited desalination equipmnet.

Name: RPS ARINYA
Owner: BCGS
Length: 28 m.
Type: Surveying vessel
Date of construction: 1962
Crew: 75
Scientists: 15
Special facilities:
Standard navigational equipment, limited desalination equipment, hydro-survey equipment.

Name: RPS ARLUNYA
Owner: BCGS
Length: 28 m.
Type: Surveying vessel
Date of construction: 1964
Crew: 75
Scientists: 15
Special facilities:
Standard navigational equipment, limited desalination equipment, hydro-survey equipment.

Institution code: 000020 Information received: 09/01/84

Surian ng Kalusugang Pambayan

(Institute of Public Health (UP-IPH))

Executive officer VALENZUELA., Amanda V.: Dean

Postal Address

Surian ng Kalusugang Pambayan
625 Pedro Gil Street, Ermita
P.O. Box EA 460
MANILA

Telephone: 502703
Cable: INOPHEALTH, MANILA

Working languages
English, Pilipino

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Inland Fisheries
Aquaculture
Limnology
Chemical Sciences
Microbiology
Pollution
Education, Training or Extension

Areas of speciality
Pelagic Fish
Algae
Micro-organisms
Plankton
Coastal Marine Waters
Inland (Fresh) Waters
Metals
Pathogenic Micro-organisms
Nutrients

Objectives and programmes
History of institution, its mandate and purpose
The Institute of Public Health was established in 1927 as a unit of the University of the Philippines for the training of medical officers in the Philippine Health Service. It was originally called the School of Sanitation and Public Health. In 1929, the name of the School was changed to School of Hygiene and Public Health, in 1938, to Institute of Hygiene and on January 28, 1971, to Institute of Public Health.
The Institute of Public Health aims to provide academic and practical training in public health, to contribute to the knowledge of preventive medicine and public health, to promote the dissemination of such knowledge and to advance the practice of public health in the Philippines through research and through active involvement in the national development programme of the country.

Research, monitoring and other activities in the last three years
Research on: a) Biology and primary productivity of ponds fed with effluent from biogas digester; b) Phytoplankton studies of selected areas along Pasig River, c) Water quality of selected oyster farms in Cavite, d) Monitoring an impact on health of sanitation program (drainage, water supply, waste disposal).

Major current research and other activities
Same as in Research, monitoring, and other activities in the last three years (d) and public health implications of effluent and sludge from biogas digesters.

Future programmes
Same as in the last three years
Continuation of current programme

Cooperative programme
- World Health Organization (Biology and primary productivity of ponds fed with effluent from biogas digesters)
- Energy Development Research Center, Philippine National Oil Commission (Public health implications of effluent and sludge from biogas digester)
- Minister of Health (National sanitarian training course)

Training programme
- Graduate courses leading to Master of Public Health, Master of Occupational Health, Master of Science in Public Health and Doctor of Public Health
- Undergraduate courses leading to Bachelor of Science in Public Health
- Training course for Sanitarians

Institution structure
The institution is divided into seven departments, the Department of Environmental and Occupational Health and Department of Medical Microbiology are the most closely involved in environmental (pollution) studies.

Staff
69 Professional staff 11 Technical staff 34 Other staff

Professional scientific staff:

Name	Degree	Speciality
Angelita C. Camacho	MPH	Public health
Lilia V. del Castillo	MPH	Community health
Virginia B. Guzman	MPH	Community health
Theresita R. Lariosa	MPH	Community health
Romulo F. Aquino	Ph.D.	Environmental chemistry, Biology
Elma B. Torres	M.Eng.	Sanitary engineering, Environmental engineering
Lina C. Somera	M.Sc.	Industrial hygiene
Benjamin C. Vitasa	M.D.	Occupational health
Mario D. Zabat	Ph.D.	Sanitary engineering, Environmental engineering
Caridad A. Ancheta	MSCH	Epidemiology
Jane C. Baltazar	Ph.D.	Epidemiology
Maridel P. Borja	M.Sc.	Biostatistics
Ophelia M. Mendoza	Dr. P.H.	Biostatistics
Ofelia D. Pardo-Saniel	MPH	Biostatistics
Adalberto R. Alday	M.D.	Virology
Nina G. Barzaga	M.D.	Microbiology
Veronica F. Chan	Ph.D.	Virology, Immunology
Antonio V. Jacalne	MPH	Bacteriology, Mycology
Eloisa D. Madraso	M.Sc.	Immunology
Nidia M. Manuson	MPH	Bacteriology, Mycology
Adelwisa R. Ortega	M.D.	Bacterial immunology
Norberto R. Ricacho	M.Sc.	Bacterial mycology
Sibilina B. Censon	MCH	Public health nutrition
Honorio M. Navarro	M.D.	Clinical nutrition
Orlando C. Mariñas	MPH	Clinical nutrition
Lucila B. Rabuco	M.Sc.	Public health nutrition
Carmencita S. Loyola	Ph.D.	Public health nutrition
Benjamin D. Cabrera	MPH	Medical parasitology
Amante C. Cruz	M.Sc.	Medical parasitology
Lilian A. Delas Llagas	M.Sc.	Medical entomology
Edito G. Garcia	MPH	Immunoparasitology
Nonette L. Jueco	M.Sc.	Medical parasitology
Nelia P. Salazar	Ph.D.	Medical entomology
Francisco S. Sy	M.Sc.	Medical parasitology
Blanche C. Barbers	MPH	Dental public health
Martin J. dela Rosa II	MPH	Maternal and child health
Elnor E. Duque	MA, MPH	Public health nursing
Wilfred U. Tiu	B.Sc.	Immunoparasitology
Corazon V. Ferreol	MPH	Family planning
Ciriaca Q. Manalo	M.Sc.	Hospital administration
Artemio A. Nielo	MPH	Public health administration
Minda Luz M. Quesada	MPH	Public health education
Fernando M. Sison	MD	Hospital administration
Florence M. Tadiar	MPH	Hospital administration
Amanda V. Valenzuela	MPH	Maternal and child health
Julita I. Yabes	M.S.	Public health nursing
Evelina C. Morales	M.Sc.	Environmental chemistry, Biology
Asuncion Eduarte	CPH	Health education
Milagros M. Herrera	MPH	Public health administration
Irma L. Parajas	MPH	Dental public health
Ma. Sandra B. Temponako	MPH	Health education

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 21000
Number of periodical subscriptions:57

Monographs and serials titles:
- Current list of serials of the Institute of Public Health
- Hygieniana Collection; publications of the faculty of the Institute of Public Health
- Index to theses; submitted to the Institute of Public Health 1982
- Local Health Surveys; research papers and field practice report by the students of IPH
- Current serials relevant to food, nutrition and environmental pollution

Equipment
2 units pH meter, 2 units spectrophotometer, 2 units analytical balance, 2 units centrifuge, HP computer with printer, microbiological equipment.

Institution code: 000021 Information received: 29/06/83

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

Executive officer KINTANAR, Roman L.: Director-General

Postal Address

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)
Asian Trust Bank Building 1424 Quezon Avenue
QUEZON CITY

Telephone: 980661-65/980671-75
Telex: 42021 PAGASA PM 66682 WXMLA
Cable: WEATHER MANILA

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities
Oceanography
Meteorology / Climatology
Education, Training or Extension

Areas of speciality
Thermal
Tide / Waves
Wind
Offshore Marine Waters
Coastal Marine Waters

Objectives and programmes
History of institution, its mandate and purpose
The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) started as Observatorio de Manila in 1865 with Federico Faura, S.J. as the director. On May 22, 1901, the observatory was reorganized and replaced by the Weather Bureau which was headed by Rev. Jose Algue. There was hardly any change instituted except in the name. The years that followed were years of growth and development. In 1947 the Forecasting Center was created and in 1949, the Bureau was recognized as a member of the World Meteorological Organization. In the same year, a new Geophysical Observatory was set up behind the UP grounds. Dr. Roman L. Kintanar was appointed as Weather Bureau Director in 1958. By virtue of P.D. 78 dated 8 December 1972, and with some amendments in 1977, PAGASA was established creating six (6) technical offices. The PAGASA was entrusted with 'providing environmental protection and utilizing scientific knowledge as an effective instrument to ensure the safety, well-being, and economic security of all the people, and for the promotion of national progress'.

Research, monitoring and other activities in the last three years
- Quantitative 24-hour Rainfall Forecasting over River Basins and Water Sheds during tropical cyclone occurrences within the Philippine area of responsibility (PAR)
- Thunderstorm Forecasting
- Regression Technique of Forecasting Tropical Cyclone Movement
- Climatological Forecasting/Typhoon Forecasting
- Operational test of methods developed by the center and other existing techniques.
- Study of Cumulus (CL-2/CL-3) Clouds in the Philippines
- Philippine Normal Atmosphere
- 5-year Rainfall Average WEMEX Network
- Sea Surface Temperature in Relation to Tropical Cyclone Development
- A Numerical Study of Tropical Cyclone Structure and Development
- Tropical Cyclone Hazard Mapping
- Development of Typhoon Damage Scale
- Research Development and Ground Testing of Indigenous Nucleating Materials
- Study of Cumulus Clouds (RADAR observation and photography) in the Philippines
- Numerical Prediction of Storm Surge
- Synoptic Prediction with 2-level Baroclinic Model
- Primitive Equation Barotropic Model
- Hygrothermic Relation Between Rice Canopy and Thermometer Shelter at Los Baños
- Climatic Assessment for Resettlement Purposes
- Regional Climates
- Probabilities of dry and wet spells at various intensity levels in the Philippines
- Modified/updated coronas climatic classification
- Coconut yield in relation to weather parameters during the 13th, 12th, and 11th months before to harvest
- Coconut Inflorescence-Weather Relation Analysis
- Seasonal Variation of Coconut Yield
- An Analysis of the Mortality Rate of Coconut
- Fabrication and Development of Meteorological Balloons

Objectives and programmes **(Cont.)**

- **Fabrication of Barotropic Filling Device**

Major current research and other activities

- Development/Improvement of Flood Forecasting and Warning Techniques Model
- Extension of Baroclinic Model
- Forecast of Surge of Northeast Monsoon
- Intensity Distance Relationship for Philippine Shallow Earthquake
- Some Aspects of the Seismicity of Puerto Galera
- Time Frequency and Seismic Instrument Design/Development
- Numerical Typhoon Modelling
- Tropical Cyclone Disaster Risk Mapping
- Objective Analysis
- Tropical Cyclone Structure
- Typhoon Moderation Research
- Tropical Cyclone Movement
- Cloud and Precipitation Development Prediction
- Air-Sea Interface Energy Flux
- Solar Radiation Climatology
- Study of Rainfall Over Northeastern Mindanao
- Wind Analysis at 100 meters, Science Garden
- Tidal Anomalies/Weather Parameter
- Earthquake Swrms at Sinquijor
- Earthquake Prediction
- Research on Meteorology Sensor Devices

Future programmes

Considering the scope and breadth of the effects of meteorology and allied sciences on man, PAGASA has pledged its resources to the attainment of identified national goals and will direct its efforts towards national priorities such as natural disaster prediction, moderation and control; food self-sufficiency; natural resources development; energy; transportation; industry; housing and health.

Cooperative programme

The following is a list of PAGASA Inter-agency projects with the corresponding Cooperating Agencies:

- Tropical Cyclone Structure Research (Ministry of Human Settlements/Technology Resource Center, MHS/TRC; UP Department of Meteorology)
- Ecological Protection of Ports and Other Coastal Projects Through Storm Surge Prediction (Man and Biosphere Inter-Agency Committee on Ecological Studies)
- Ecological Factors for Optimum Seedling Survival (Bureau of Soils; Bureau of Forest and Development, BFD; National Irrigation Administration, NIA)
- Regional Fuel Cycle Center on the Selection of Site for a National Radwaste Management Center (Ministry of Public Works, Transportation and Communication; Bureau of Coast and Geodetic Survey; Ministry of Local Government and Community Development; National Power Corporation)
- Integrated Programme on the Control of Sedimentation of River and Canals in Existing Irrigation System (Bureau of Soils; Bureau of Forest Development; Bureau of Plant Industry; Bureau of Mines and Geosciences; National Pollution Control Commission; Bureau of Flood Control and Drainage; National Water Resources Council)
- Environmental Impact of Human Activities on Forest Ecosystem (Kaingin Management)
- Weather Modification Research Project-Cloud and Precipitation Physics (NSDB)
- Rainfall Runoff Relations for Apalit and Arayat Stations (NWRC; NPC; MPW)
- Coastal Zone Management (BFAR; BFD; BPW; MN; PCG-PN)
- Biosphere Reserve Project
- Ecological Impact of Agricultural Land Use of Upland Soil
- Effects of Human Activities on Grassland Ecosystem

Training programme

PAGASA offers a course for Class II meteorological personnel, four courses for Class III and three courses for Class IV personnel. The training courses for Class II and Class IV meteorological personnel are conducted regularly, at least once a year, and the Class III courses as need arises. The qualification requirements and curricula for training the various classes of meteorological personnel contained in the WMO Guidelines for the education and training of personnel in meteorology and operational hydrology (WMO-No. 258) are closely followed in the training courses in PAGASA.

As PAGASA comprises not only meteorological but also seismological and astronomical services, the training courses related to the last two fields are provided on an ad hoc basis. Meteorology is also taught as a minor subject on these courses. Around 100 students register for all the PAGASA courses yearly.

Institution structure
PAGASA is composed of six major offices, each headed by a Director, and three support services. These are the National Weather Office (NWO), the National Atmospheric, Geophysical and Astronomical Data Office (NAGADO), the National Geophysical and Astronomical Office (NGAO), the National Institute of Atmospheric, Geophysical and Astronomical Sciences (NIAGAS), the Typhoon Moderation Research and Development Office (TMRDO), and the National Flood Forecasting Office (NFFO). The support services include the Administrative Service, the Financial and Management Service and the Technical Service. A smaller unit which falls under the direct supervision of the Director-General is the Public Information and International Affairs Staff.

Staff
473 Professional staff 1550 Technical staff 172 Other staff

Professional scientific staff:

Name	Degree	Speciality
Abinoja, Amado B.	M.S.	Dynamic meteorology
Acuña, Ruben C.	B.S.	Agrometeorology
Aguilar, Lydia	B.S.	Physics
Alcazar, Paulino Jr. S.	B.S.	Meteorology, Weather observation, Weather forecasting, Weather analyses
Almazan, Shirley	B.S.	General meteorology
Amadore, Leoncio	M.Sc.	Numerical weather analysis, Numerical weather prediction, Physical meteorology
Aquino, Eugenio M.	B.S.	Physics, Atmospheric thermodynamics Physical meteorology, Meteorological statistics, Tropical meteorology
Arafiles, Catalino P.	M.A.	Physics, Electrical engineering, Meteorology, Physical oceanography
Asuncion, Juan F.	M.S.	Meteorological analysis, Forecasting and research
Asuncion, Mariano T.	M.S.	General meteorology/radar, Meteorological physics
Balbao, Leticia L.	M.N.S.A.	Radioisotope technique, Disaster preparedness
Bolante, Arnulfo Q.	B.S.	General meteorology, Marine meteorology
Buan, Rodito D.	M.S.	Agrometeorology, Hydrometeorology, Climatology
Bucoy, Jaime F.	G.C.(Meteorology)	Synoptic meteorology
Cardenas, Efigenia E.	B.S.	General meteorology, Ecology, Human resource dev. (HRD), MDP training and development
Canuel, Nestor L.	B.S.	Flood forecasting, Weather/typhoon forecasting
Camacho, Florante	B.S.	Hydrology
Cornelio, Edito G.	B.S.	Meteorological instruments
Doctor, Claro S.	B.S.	Synoptic meteorology, Tropical meteorology, Physical oceanography, Elementary hydrometeorology, Marine/upper air/surface Synoptic observations General meteorology, Meteorological instruments
Davis, Catalino L.	B.S.	Oceanography, Seismology Instrumentation
Encarnacion, Rolu P.	B.S.	Seismology Physical oceanography General meteorology, Disaster preparedness
Encarnacion, Ruben N.	B.S.	Met. telecommunications
Ferraris, Cipriano C.	M.S.	Meteorology, Atmospheric thermodynamics, Meteorological statistics, Hydrology, Climatology
Felisarta, Rodulfo C.	M.S.	Aviation meteorology
Fontano, Araceli L.	B.S.	Data processing + programming
Flores, Jesus F.	M.S.	Tropical meteorology

Staff (Cont.)

Name	Degree	Speciality
Fontano, Sixto F.	B.S.	Met. telecommunications, General meteorology, Synoptic meteorology
Francisco, Raquel	M.S.	Cloud physics
Garcia, Lolita C.	D.I.C. Geophysics	Seismology
Gener, Claudio	B.S.	Marine meteorology
Inciong, Simeon V.	B.S.	Positional astronomy
Lao, Rafael P.	B.S.	Computer program development, Application, Systems analysis, Design
Lim, Lydia	B.S.	Meteorology, Hydrology
Liwag, Dominador	B.S.	Surface weather observation and coding, Radio programming broadcasting
Llarena, Onofre	B.S.	Meteorology, Mathematics
Laudet, Teresita	M.S.	Statistics, Mathematics, Agroclimatology, Agrometeorology
Lomarda, Nanette	B.S.	Meteorology, Oceanography
Lomotan, Bayani	B.S.	Climatology, Agrometeorology, Hydrology, Air pollution, Meteorology
Marqueses, Lazaro	B.S.	Surface Wx Observation + Codes Weather Map Analysis, Drafting, Surveying, Field operations, Observational procedure, On the spot inspection
Martin, Santiago	B.S.	Oceanography, Tropical meteorology
Monroy, Gabriel	B.S.	Wx. forecasting, Thermodynamics
Ortega, Daisy	B.S.	Meteorological statistics
Paculan, Romulo G.	undergraduate	Hydrology, Programming
Perez, Rosa T.	M.S.	Computer programming, Systems analysis, Numerical modelling, Meteorology
Parong, Eduardo M.	B.S.	Weather forecasting, Tropical cyclone forecasting
Pineda, Alan L.	G.C.(Meteorology)	Hydrology, Numerical analysis, Computer programming
Pineda, Eduardo	B.S.	Agrometeorology
Pineda, Amado E.	B.S.	Weather + typhoon forecasting, Weather map analysis
Reyes, Crisostomo C.	B.S.	Dynamic meteorology, Synoptic meteorology
Sabello, Nazario N.	B.S.	Statistics, Climatology, Agrometeorology
Sadang, Epifanio	B.S.	Hydrology, Flood forecasting
Santos, Teodora P.	B.S.	Hydrology
Soriano, Bernardo Jr. M.	M.S.	Hydrometeorology
Tabamo, Gaudioso R.	M.S.	Agrometeorology, Dynamic meteorology, Climatology, Statistics
Talib, Basman D.	B.S.	Mathematics, Meteorology,
Tibig, Lourdes V.	B.S.	Climatology
Esguerra, Marianito	B.S.	Synoptic meteorology
Ellaquim, Adug	B.S.	Dynamic meteorology
Macalincag, Teodoro	B.S.	Seismology
Preclaro, Carlos	A.B.	Geology
Uy, Efren	B.S.	Seismology
Ballan, Primitivo	B.S.	Climatology
Rañon, Balbino	B.S.	Meteorological instruments
Enriquez, Crisologo	B.S.	Tropical meteorology
Nieva, Rodrigo	B.S.	Astronomy
Jose, Aida M.	M.S.	Agrometeorology

Staff (Cont.)

Name	Degree	Speciality
Calpo, Ernesto V.	B.S.	Seismology
Kintanar, Roman L.	Ph.D.	Physics, Seismology
Lirios, Juanito F.	Diploma (Hydrology)	Hydrology, Meteorology, Mathematics
Bonjoc, Manuel C.	B.S.	Meteorology
Itoralba, Narciso	B.S.	Tropical meteorology
Calimbas, Calimabas	B.S.	Seismology
Trillanes, Ulpiano	B.S.	Public service, Seismology
Ana B. de Sesto	M.S.	Computer programming

Note: G.C.= Graduate Course

Premises/facilities

Building area: 34250 m² Laboratory area: 200 m²
With facilities for:
Visiting Scientists: 150 Students: 150

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 20000
Number of periodical subscriptions: 28

Equipment

Geostationary satellite (GMS), weather surveillance radar, upper air instrument, seismological instrument, astronomical instrument, calibration equipment, remote sensing equipment, communication equipment, computer.

Research craft

Name: RPS ALBACORA
Owner: Bureau of Fish. + Aquatic Resources
Length: 60 m.
Type: Research vessel
Date of construction: 1970
Crew: 27
Scientists: 2
Lab. space: 12 m2
Special facilities:
Radar

Institution code: 000022 Information received: 15/11/83

Bureau of Research and Laboratories

Executive officer SUMPAICO., Joaquin S.: Director

Postal Address

Bureau of Research and Laboratories
San Lazaro Compound- Rizal Avenue
P.O. Box 911
SANTA CRUZ, MANILA

Telephone: 441092

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities
Microbiology Pollution
Medicine

Areas of speciality
Pathogenic Micro-organisms

Objectives and programmes
History of institution, its mandate and purpose
The history of the Bureau of Research and Laboratories can be traced back to the incorporation of a Division of Laboratories to the organizational set-up of the Department of Health on November 3, 1947, in accordance with Executive Order No. 94, series 1947, which reorganized the entire government of the Republic of the Philippines. This Division consisted of the diagnostic laboratory in Manila and the Alabang Serum and Vaccine Laboratories in Alabang, Muntinglupa, Rizal.
In 1950 this Division was converted into an office with the rights and prerogatives of a Bureau directly under the office of the Secretary of Health and was called the Public Health Research Laboratories. This set-up continued up to March 16, 1959, when the implementation of the latest reorganization of the Department of Health took effect.
Under Reorganization Plans No. 12-A, 13-A on Health, the Public Health Research Laboratories was abolished and in its place the present Bureau of Research and Laboratories was created. The implementing details of these Plans are embodied in the Executive Order No. 288 series of 1958. The Bureau has expanded to include the Virology Section in 1961 and the Clinical Laboratories Licensure Section and to include the licensure of blood banks in in 1966. RA No. 320 in 1964 separated the Division of Food and Drug Testing from the Bureau to the Food and Drug Administration. In 1967, the Production Laboratories Section was converted into a Division. This set-up continued until 1973 when the Integrated Reorganization of the Executive Departments authorized under Presidential Decree No. 1, dated Sept. 21, 1972, was implemented.
The main objectives of the Bureau are to develop:
- a comprehensive programme for manufacture of vaccines, sera and other antitoxins as well as the processing, standardization and improvement of biological products
- a program for the processing of fresh human blood
- a program of research studies on important communicable diseases, especially on its bacteriological, parasitological, viral and pathological aspects
- a program for the analysis of body fluids and tissues, water and air, and for the performance of autopsies
- standards for and regulate the operation, maintenance and establishment of clinical laboratories and blood banks
- a coordinated and integrated national public health laboratory system and exercise technical supervision over laboratories of national hospitals, regional and other peripheral laboratories and blood banks

Research, monitoring and other activities in the last three years
The Environmental Health Examination Section (EHES) is one of the sections under the Division of Laboratories of the Bureau of Research and Laboratories and is charged with the examination of water for pollutant such as contaminating organisms especially of fecal origin such as the *E. coli* which are known as fecal coliform. Other pollutants are chemicals like nitrite whose presence is also indicative of fecal contamination and other physical and chemical characteristics which do not fall within the permissible limits required by the National Standard for Drinking Water. Aside from its activities on bacteriological and chemical pollution of water, this Section is also involved in determining the environmental hazards to the workers in industries and also those in the environment which have direct bearing with the health of the people exposed to it. It also undertakes examination of industrial effluents for BOD, COD, DO etc.

Objectives and programmes (Cont.)

Major current research and other activities
Same as in the last three years

Future programmes
Same as in the last three years

Cooperative programme
Monitoring of pollution levels of bathing areas, oysters and shellfish beds in Manila Bay. This is a cooperative program with the National Pollution Control Commission (NPCC), Bureau of Fisheries and Aquatic Resources (BFAR), Philippines Coast Guard (PCG), National Science Development Board (NSDB), and the Department of Health (DH).

Institution structure

ADMINISTRATIVE DIVISION

DIVISION OF LABORATORIES
- Licensure Section
- Bacteriology Section
- Parasitology Section
- Immunology Section
- Clinical Pathology Section
- Environmental Health Examination Section
- Virology Section
- Research Section

DIVISION OF BIOLOGICALS
- Production Laboratory Section (Division)
- Biologic Products Quality Section
- Laboratory Animals Section
- Blood Plasma Dehydration Section

Equipment

BOD incubator, turbidimeter, drying ovens, distilling apparatus, vacuum tester, spectrophotometers, analytical balance, Quebec colony counter and autoclave incubators.

Institution code: 000023 Information received: 01/01/83

Natural Resources Management Center (NRMC)

Executive officer ROQUE, Celso R.: Director-General

Postal Address

Natural Resources Management Center (NRMC)
8th Floor, Triumph Building, 1610 Quezon Avenue, Diliman
QUEZON CITY

Telephone: 969472/951991/951992/951993

Working languages
English, Pilipino

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Inland Fisheries
Resources Management	Oceanography
Physical Sciences	Geology (incl. Sedimentology)
Policy and Planning	Mutual Assistance / Technology Transfer
Computer / Information Systems	Education, Training or Extension

Areas of speciality

Demersal Fish	Pelagic Fish
Other Vertebrates	Lobsters
Shrimps / Prawns	Other Invertebrates
Algae	Micro-organisms
Plankton	Benthos
Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Inland (Fresh) Waters
Mangroves Ecosystems	Coral Ecosystems
Nutrients	

Objectives and programmes

History of institution, its mandate and purpose

The Natural Resources Management Center (NRMC) was created on October 25, 1976 by virtue of Presidential Decree No. 1041 to conduct an up-to-date inventory of our country's natural resources; for improving the information gathering, handling and processing in the Ministry of Natural Resources; for assessing the role of natural resources in national and foreign policy and strategy formulation; and to develop the country's capability to utilize modern resource information acquisition handling and processing technologies for use in resource and environmental planning, management and monitoring.

Research, monitoring and other activities in the last three years

a) Mollusc population: their biology, ecology and distribution
b) Marine parks/reserve project
c) Mapping of shallow reef areas
d) Assessment of mangrove areas as spawning ground of fishes and crustaceans
e) Assessment of coastal waters for fisheries resources management, utilization and conservation.
f) Mapping of major fishpond areas

Major current research and other activities

Same as in the last three years

Future programmes

Continuation of current programme

Cooperative programme

- Bureau of Fisheries and Aquatic Resources (Marine parks/reserve program, shallow reef mapping, fishpond mapping
- University of the Philippines Marine Science Center (Marine parks/reserve program, mollusc population: their biology, ecology and distribution, coastal resources and environment survey, study of the coral resources and the effects of pollutants and other destructive factors on coral communities and related fisheries in the East Asian Seas Region)
- University of the Philippines Natural Science Research Center (Assessment of mangrove areas as spawning ground of fishes and crustaceans, coastal resources and environment survey, assessment of coastal waters, plankton studies, marine parks/reserves program)
- Siliman University (Marine parks/reserves program and national mangrove program, study of coral resources and effects of pollutants and other destructive factors on coral communities and related fisheries in the East Asian Seas Region)

Institution structure

The NRMC is composed of the following divisions and programs:
- Remote Sensing Technology Applications Division
- Remote Sensing Systems Development and Maintenance Program
- Resource Policy and Strategy Research Program
- Publications, Public Information and External Services

Institution structure (Cont.)
- Office of the Director General
- Administrative and Finance Division

Staff
46 Professional staff 67 Technical staff 121 Other staff

Professional scientific staff:

Name	Degree	Speciality
Zamora, P.	Ph.D.	Plant physiology
Gomez, E.	Ph.D.	Marine biology
Lacanilao, F.	Ph.D.	Physiology
Camacho, A.	Ph.D.	Aquaculture
Yap, H.	M.S.	Coral studies
Mines, A.	Ph.D.	Marine fisheries
Fortes, M.	M.S.	Eel grass and mangrove
Trono, G.	Ph.D.	Marine phycology

Premises/facilities
Building area: 3165 m²
With facilities for:
Students: 10

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1500
Number of periodical subscriptions:15

Monographs and serials titles:
- Monographs
- Serials

Equipment
Two water quality testers, salinometer, 9 complete scuba/diving equipment, inflatable raft, echo-sounder, depth meter, pH meter, 2 microscopes, magnetic and brunton compass, photographic equipment, Image-100 System, hydrometer, binocular, electronic distance measuring equipment, universal transit, altimeter, theodolite, cartographic equipment, spectroradiometer, spectrophotometer, zoom transferscope, stereoscope, UNIVAC System 80, Minicomputer, TRS 80 Microcomputer, microfiche.

Institution code: 000024 Information received: 12/09/84

Instituto ng Pananaliksik Pangkagubatan

(Forest Research Institute (FORI))

Executive officer POLLISCO, Filiberto S.: Director

Postal Address

Instituto ng Pananaliksik Pangkagubatan
COLLEGE, LAGUNA 3720

Telephone: 2269/3329/3320/3221
Cable: FORI, COLLEGE, LAGUNA

Working languages
Pilipino, English

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Resources Management
Chemical Sciences	Microbiology
Pollution	Policy and Planning
Mutual Assistance / Technology Transfer	Marketing / Economics
Social Sciences	Computer / Information Systems

Areas of speciality

Marine Mammals	Other Vertebrates
Brackish Waters	Inland (Fresh) Waters
Mangroves Ecosystems	Coral Ecosystems

Objectives and programmes

History of institution, its mandate and purpose
Before 1974, forestry research was undertaken by the Research Division of the Bureau of Forestry. However, the Philippine Government felt the need to accelerate research related to forest production, protection and management. In this connection, a reorganization was done. As a result, the Forest Research Institute under the Ministry of Natural Resources was created on 18 December 1974 by virtue ofPresidential Decree No. 607. The location of its headquarters is at College, Laguna. The Institute coordinates, formulates and conducts accelerated research in the production, management and protection of the Philippine forest resource.

Research, monitoring and other activities in the last three years
The Institute has completed different studies, however, only one project has been finalized in relation to coastal development. Representative participants of the Institute also attended training courses and seminars on this matter. A study on the population and survival evaluation of green sea turtle *(Chelonia mydas)* had also been done.

Major current research and other activities
Phytosociology and Development of Palsabangon Mangrove Forest at Pagbilao, Quezon (Cesar Arroyo)

Future programmes
Research on the production and development of mangrove as well as rehabilitation of watersheds and mangrove swamps. A research program on Mangrove and Beach Type Forest for 1983-1988 has been formulated as part of the FORI CORPLAN.

Cooperative programme
The Institute is having active cooperative research programmes with other major Institutions in the Philippines as well as in other countries on different aspects of forest resources protection, management and production. It has links with international organizations such as FAO, UNDP, IDRC, IBRD, IUFRO, DANIDA, USAID, BIOTROP, etc. Cooperative research and training programmes are with local governmental agencies like NEPC, BFAR, PCARRD, FPRDI, NSTA, NRCP, UPLBCAS, UPLBCF, NACIAD, BFD, MNR on various aspects of Forest resources production and conservation.

Training programme
Provides training to researchers of the Institute in the fields of statistics, experimental design, wildlife research methods, quantitative vegetational analysis, and in various fields of forestry. Scholarship grants are awarded to qualified researchers in the various disciplines/specialization in forestry, wildlife, social sciences, economics and the like as identified by the scholarship committee of the Institute. Scholarships are under the following granting agencies/funds: FORI Scholarship, PCARRD, NSTA, USAID, IBRD, DANIDA, CIDA, JICA, BIOTROP, PAEF-FULLBRIGHT-HAYS, EAST WEST CENTER, COLOMBO PLAN, UNDP and other foreign grants.

Institution structure
The Institute is divided in 5 research divisions:
- Forest Regulation and Utilization
- Outdoor Recreation and Wildlife
- Silviculture and Forest Protection
- Socio-economics
- Watershed and Range

and 3 non-research divisions namely Technical Services Division, Administrative Services Division and Planning and Management Services Division. In addition, there are units/offices which are under the office of the Director: Special Programs and Manpower Development Office, Field Operations Office, Legal Staff, Technical Technical Consultants, and FORI Technical Review Board. There are at present 15 research centers strategically located althroughout the country, with one specifically concerned with mangroves - Agro-forestry and Mangrove Research Center. Each of these units have specific research thrusts including parks and wildlife, mangrove and beach type forests, etc.

Staff
0 Professional staff 375 Technical staff 332 Other staff

Professional scientific staff:

Name	Degree	Speciality
Atabay, R.	B.S.	Range management
Alonzo, S. (Ms)	B.S.	Biology, Wildlife management
Baconguis, S.	M.S.	Civil engineering, Water resources
Bravo, M.	DVM, DAP + E.	Pathology, Parasitology, Entomology
Calabia, B.	M.S.	Forestry, Silviculture
Callo, I. (Ms)	B.S.	Med.Tech
Callo, R.	M.S.	Zoology
Cruz, dela V.	M.S.	Logging engineering
Custodio, C.	B.S.	Animal science
Datuin, C.	B.S.	Zoology, Wildlife management
Diaz, C.	M.S.	Forest economics
Encendencia, M.E. (Ms)	B.F.	Forestry, Forest ecology
Enriquez, E.	BSF	Forestry, Forest ecology
Eusebio, A.	B.S.	Forestry, Silviculture
Eusebio, M.	Ph.D.	Pathology
Fabellar, A. (Ms)	B.S.	Agriculture
Florido, L.	M.S.	Watershed management
Formento, D. (Ms)	B.S.	Fisheries
Generalao, M.	M.S.	Timber management
Halos, S. (Ms)	Ph.D.	Genetics
Jasmin, B.	M.S.	Forestry (Watershed management)
Manilay, S. (Ms)	B.S.	Biology
Medrano, A.	B.S.	Civil engineering
Melana, E. (Ms)	B.S.	Forestry, Ecology
Mendoza, M. (Ms)	B.S.	Zoology, Wildlife management
Nepomuceno, P. (Ms)	B.S.	Zoology
Pollisco, F.	Ph.D.	Wood science technology
Quiñones, M. (Ms)	M.S.	Zoology, Wildlife management
Quiniones, S.	Ph.D.	Pathology
Ranes, B.	B.F.	Forestry, Wildlife management
Reyes, E. (Ms)	B.S.	Biology, Biological science
Sinha, C. (Ms)	Ph.D.	Wildlife ecology, Wildlife management
Taguiam, G. (Ms)	B.S.	Agriculture
Tandug, E.	Ph.D.	Forestry (Silviculture), Forest ecology
Tomboc, D.	M.S.	Forestry, Timber management
Veracion, R.V.	Ph.D.	Environmental science, Watershed management
Velasco, A.	M.A.	Psychology, Sociology
Villamor, C. (Ms)	M.S.	Animal science
Virtucio, F.	Ph.D.	Forest mensuration

Staff (Cont.)

Name	Degree	Speciality
Yao, C.	M.S.	Tree physiology
Calanog, L.	B.S.	Psychology
Melana, D.	M.F.	Silviculture
Quitzon, S.C.	M.S.	Rural sociology
Saplaco, M.	M.S.	Rural sociology

Premises/facilities
Building area: 2858 m² Laboratory area: 559 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 4375
Number of periodical subscriptions: 39

Monographs and serials titles:
- How to grow rattan, by M.L. Generalao, 1981
- Abstracts of References on Mangroves, by M.L. Generalao & C. Arroyo, 1981
- Adaptive Strategies on Swidden Based Societies, ed. Dr. H. Olofson, 1981
- Habitat (editor Dr. G. Diokno, current)
- FORI Brochure (Revised, 1982) ed. C.D. Fontanilla
- How to grow Bamboo, by V. Lasmaria, A. Bumarlong, F. Ordinario, A. Lapis and A. Piñol, 1982
- How to grow Medicinal Plants, by M. Generalao, 1982
- Sylvatrop, The Philippines Forest Research Journal (current - 4 issues/year, English)
- Canopy International (12 issues/year, English)

Equipment
Atomic absorption spectrophotometer, pH meter, Mettler balance, centrifuges, Kjeldahl apparatuses, binoculars, limnology kit, research microscopes (AO) with photomicrography, incubator, ovens, Monroe programmer, camera with telephotos, microtome, stereoscope, radio telemetric equipment, Scuba diving set.

Aquarium facilities

Species maintained for experimental purposes:

Cervus philippinus	*Axis calamianensis*	*Polyplectron emphanum*
Megapodius freycinet	*Dendrocygna a. arcuata*	*Anas luzonica*
Crocodylus porosus	*Gallinule chloropus luzon*	*Porsana pusilla pusilla*

Institution code: 000025 Information received: 23/01/84

Marine Research Office, (USC-MRO)

Executive officer MURNANE, Theodore D.: Officer-in-charge

Postal Address

Marine Research Office, (USC-MRO) **San Carlos**
USC-Technological Center, Banilad
CEBU CITY 6401, CEBU

Telephone: 82511/82550/90118
Cable: STEYL, CEBU

Working languages
Pilipino, Cebuano, English

Nature of institute
Academic Private (non-profit)

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Oceanography
Chemical Sciences	Microbiology
Pollution	Education, Training or Extension

Areas of speciality

Demersal Fish	Pelagic Fish
Algae	Micro-organisms
Plankton	Benthos
Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Mangroves Ecosystems
Coral Ecosystems	Nutrients

Objectives and programmes

History of institution, its mandate and purpose
The Marine Research Office is an institute for marine research developed within the Department of Biology. With aid from the German government such as the German Academic Exchange and other sources, marine consultants were made available over a ten-year period (1971-1982), a marine station and laboratory were out-fitted and a full marine program up to the masters was instituted.

Major current research and other activities
The current direction of research of the institute is two-fold: i) the ecophysiology (basic) of commercially important seaweeds and fishes; ii) pollution studies with regard to marine environment. The present aim is to make the institute financially independent of the University's subsidy.

Cooperative programme
Kiel University, Kiel, Germany (ecophysiological studies, short-term lecturer); Heidelberg University, Heidelberg, Germany (short-term lecturers); University of the Philippines - implementation of basic research.

Training programme
Graduate courses in Marine Biology (in coordination with the Biology Department); Undergraduate courses leading to B.Sc.

Institution structure
The USC-MRO is under the purview of the Presidential Assistant for Research and Faculty Development which reports to the Vice President for Academic Affairs.

Staff
6 Professional staff 2 Technical staff 4 Other staff

Professional scientific staff:

Name	Degree	Speciality
Tan Tiu, Antonieto	Doctorial studies	Ecophysiology, Holuthuria
Liao, Lawrence	M.Sc.	Algae
Montecillo, Exuperancio (Prof	M.Sc.	Coral taxonomy, Siganids
Yap, Tony	M.Sc.	Bio-chemistry of estuarine waters, Marine pollution
Bacolod, Primitivo T.	M.Sc.	Experimental physiology, Marine ecology
Schramm, Winfrid (consultant	Ph.D.	Algae, Experimental physiology

Premises/facilities

Laboratory area: 300 m²

With facilities for:
Visiting Scientists: 2 Students: 20

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 72
Number of periodical subscriptions:15

Equipment
WILD stereomicroscope, 15 microscopes, pH meter, salinometer, current meter, photometer, oxygen meter, spectrophotometer, plankton gears, inverted microscopes, 2 titration boxes, muffle furnace, DOC analyzer, quantum light meter, water samplers, piston burette, micro-piston burette.

Aquarium facilities
Number of tanks: 10

Organisms maintained:
Pelagic Fish | Other Invertebrates | Algae

Species maintained for experimental purposes:

Eucheuma cottoni | *Eucheuma striatum* | *Eucheuma spinosum*
Siganus guttatus | *Diadema setosum* | *Tripnuestes spp.*
Haliotis asinina | *Haliotis vera*

Research craft
Name: BANGSI
Owner: USC-MRO
Length: 17 m.
Type: banca single hull
Date of construction: 1980
Crew: 2
Scientists: 3
Lab. space: 7 m2
Special facilities:
current meter, echosounder, some oceanographic instruments and fishing gears.

Name: RUBBER BOAT
Owner: USC-MRO
Length: 4 m.
Type: outboard motor
Date of construction: 1974
Crew: 1

Institution code: 000026 Information received: 19/09/83

Silliman University Marine Laboratory

Executive officer ALCALA, Angel C.: Director

Postal Address

Silliman University Marine Laboratory
DUMAGUETE CITY 6501

Telephone: 2397

Working languages
English, Pilipino

Nature of institute
Private (non-profit)

Main fields of activities
Biological Sciences
Oceanography
Pollution
Education, Training or Extension
Ecological Sciences
Chemical Sciences
Geology (incl. Sedimentology)

Areas of speciality
Demersal Fish
Other Invertebrates
Brackish Waters
Metals
Other Vertebrates
Coastal Marine Waters
Coral Ecosystems

Objectives and programmes
History of institution, its mandate and purpose
The Laboratory was set up in 1975 as an integral part of Silliman University's Environmental Center with initial funding from the United Church of Canada and the United Board for Christian Higher Education in Asia, 475 Riverside Drive, New York City. It has since drawn mainly upon local and national research grants for its operational expenses. The research activities are oriented and unrestricted in chemical and biological oceanography.
Objectives include research on the biological resources of marine waters in central Philippines with emphasis on species used by man for food, on secondary productivity of shallow marine areas, on conservation of these areas, and on chemical and physical pollution of marine waters; teaching of marine biology at the University (graduate levels); and extension of research findings through educational processes to the coastal human populations.

Research, monitoring and other activities in the last three years
- Ecology and spawning of certain species of rabbitfish (*Siganus*)
- Fish yield of coral reef of Sumil
- Growth of *Tridacna* species in nature
- Ecology of edible molluscs in Bais Bay, Negros Oriental
- Growth and recolonization of stony corals in dynamite-blasted reefs
- Growth rates of stony corals
- Fish yield of artificial reefs made of tires
- Heavy metals pollution of coastal waters of Negros Island
- Public campaign on marine resources conservation and increasing fish production through construction of artificial reefs
- Ecology of marine turtles

Major current research and other activities
- Water pollution research and monitoring in the Sulu Sea and Tanon Strait, Central Visayas (Dr. S. Lowrie and Dr. A.C. Alcala)
- Growth rates of hard corals in Sumilon Island (Auberson, B. (Ms), Dr. A.C. Alcala and L.C. Alcala)
- Fish yield of coral reefs of Apo and Selinog Islands in the Mindanao Sea (Dr. A.C. Alcala and T. Luchavez)
- Parasitology and taxonomy of coral reef fish (Dr. F.J. Vande Vusse)
- Establishing sanctuaries on Apo and Selinog Islands (Auberson, B. (Ms), Dr. F. Vande Vusse and T. Luchavez)
- Building artificial reefs along sea coast (L.C. Alcala)
- Conservation of renewable marine resources (B. Malayang III)

Future programmes
- Ecological studies of bays, estuaries and rivers
- Geology of reefs and coastal regions

Cooperative programme
Visiting researcher programmes with the following institutions:
- University of California, Los Angeles, California
- University of Chicago, Department of Anatomy, Chicago, Illinois
- Gustavus Adolphus College, Minnesota
- Smithsonian Institution, Washington, D.C.
- University of the Philippines, Marine Sciences Center, Diliman, Quezon City, Philippines

Student exchange programme with:
- Gustavus Adolphus College, Minnesota, U.S.A.
- Westmar College, Iowa, U.S.A.

Objectives and programmes (Cont.)
Training programme
B.Sc. in biology, chemistry and physics
M.Sc. in biology

Institution structure
The Laboratory Director reports to the Vice President for Research, Extension and Development, one of major division of the University. The three departments are:
- Research
- Teaching
- Extension

Staff
7 Professional staff 14 Technical staff 2 Other staff

Professional scientific staff:

Name	Degree	Speciality
Alcala, A.C.	Ph.D.	Vertebrate ecology, Marine ecology
Lowrie, S.	Ph.D.	Organometallic chemistry
Auberson, B. (Ms)	M.Sc.	Biology of coelenterates
Vande Vusse, F.		Parasitology (Marine fishes), Parasitology (Invertebrates)
Berdach, J.	M.Sc.	Marine algology
Carumbana E. (Ms)	M.Sc.	Aquaculture

Premises/facilities
Laboratory area: 100 m²
With facilities for:
Visiting Scientists: 3

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 200

Monographs and serials titles:
- Silliman Journal (English, available on exchange or purchase)

Equipment
Microscopes (research, plankton, stereoscopic), Scuba diving gear (10 complete sets plus 2 air compressors), ovens, underwater camera with flash unit, several high speed plankton apparatus, microtome, three 4-wheel drive vehicles, UV atomic absorption spectrophotometer, IR spectrophotometer and gas chromatograph.

Aquarium facilities

Organisms maintained:
Demersal Fish Molluscs Crustaceans

Species maintained for experimental purposes:

Chanos chanos *Siganus sp.* *Cardisoma sp.*
Sesarma sp. *Uca sp.* *Dolabella sp.*

Institution code: 000027 Information received: 01/04/81

Zoology Department, National University of Singapore

Executive officer LAM Toong Jin: Associate Professor

Postal Address

Zoology Department, National University of Singapore
Lower Kent Ridge Rd.
SINGAPORE 0511

Telephone: 7756666-2141
Telex: UNISPO RS 33943
Cable: UNIVSPORE

Working languages
English

Nature of institute
Academic

Main fields of activities
Biological Sciences
Marine Fisheries
Resources Management
Limnology
Education, Training or Extension
Ecological Sciences
Inland Fisheries
Aquaculture
Pollution

Areas of speciality
Demersal Fish
Other Vertebrates
Shrimps / Prawns
Plankton
Coastal Marine Waters
Inland (Fresh) Waters
Coral Ecosystems
Metals
Nutrients
Pelagic Fish
Cephalopods
Other Invertebrates
Benthos
Brackish Waters
Mangroves Ecosystems
Petroleum Hydrocarbons
Halogenated Hydrocarbons

Objectives and programmes

The Zoology Department was initiated in 1950 with the creation of a professorial appointment designated as the Raffles Chair of Zoology. The Department provides undergraduate teaching courses and courses at an advanced level.

Research activities of the Department can be broadly categorised under 3 areas: animal physiology (reproductive physiology, nutrition, growth and environmental physiology), resource ecology (aquatic ecology and pollution) and applied zoology (aquaculture, applied entomology and poultry research). In addition research is being conducted in the following fields: genetics and histo-immunology, animal behaviour, taxonomy and systematics and acupuncture, biochemistry and molecular biology.

Training programme

- Courses in Biology A (botany, zoology, ecology, biogeography, evolution and morphology)
- Courses in Biology B (biochemistry, physiology, genetics, cell biology, microbiology)

The Department also offers B.Sc., M.Sc. and Ph.D. programmes.

- Honours (advanced) courses in Zoology (genetics, immunology, histology, animal behaviour, molecular biology, pest management, acarology, fisheries, aquaculture, animal production systematics, biometrics, comparative endocrinology, development biology, comparative biochemistry, biology of parasites, epidemiology and marine ecology)

Institution structure

Major department facilities include the following:

- Fifteen research laboratories including a radioisotope laboratory
- seawater recirculating system
- three large aquarium areas (wet laboratories)
- Zoological Reference Collection (extensive regional collection of all phyla since 1862) - former collection of the Raffles Museum containing many type specimens
- insectary
- four cold rooms
- animal culture room (46 mutant strains of @Drosphila< @melanogaster< and 11 mutant strains of mouse)
- electron microscope unit
- photographic unit
- tissue culture facilities
- radioimmunoessay facilities
- stereotaxis facilities
- microcomputers and IBM 4341 VM/370 computing facilities
- access to floating fish farm, Jurong Bird Park and Singapore Zoological Garden

Staff
20 Professional staff 19 Technical staff 17 Other staff

Professional scientific staff:

Name	Degree	Speciality
Lam, T.J.	Ph.D. (Head)	Fish physiology, Aquaculture
Chan, K.L.	Ph.D.	Vector biology, Vector control
Murphy, D.H.	M.Sc.	Mangrove ecology
Chen, T.W.	Ph.D.	Physiology, Animal production
Sin, Y.M.	Ph.D.	Histo-immunology
Khoo, H.W.	Ph.D.	Coral-reef fishes, Ecology management, Aquaculture
Phang, V.	Ph.D.	Genetics, Aquarium fish culture
Teo, L.H.	Ph.D.	Toxicology, Aquaculture
Shim, K.F.	Ph.D.	Animal nutrition
Tan, W.H.	Ph.D.	Marine biology, Mollusc culture
Chou, L.M.	Ph.D.	Reptiles, Turtle, Coral reef ecology
Ho, S.H.	Ph.D.	Toxicology
Ip, Y.K.	Ph.D.	Physiology, Biochemistry
Yang, C.M. (Ms)	M.Sc.	Marine copepoda
Hori, R.	Ph.D.	Biology (fish, echinoderms)
Singurdsson, J.B.	Ph.D.	Marine biology, Culture (bivalves)
Counsilman, J.J.	Ph.D.	Animal behaviour
Tan, C.H.	Ph.D.	Biochemistry, Endocrinology
Munro, A.D.	Ph.D.	Endocrinology
Nadchatram, M.	M.Sc.	Medical entomology, Parasitology
Ding, J.L.	Ph.D.	Biochemistry, Tissue culture

Premises/facilities
Building area: 100000 m² Laboratory area: 25000 m²
With facilities for:
Visiting Scientists: 10 Students: 500

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 11500

Equipment
Electron microscope with scanning and X-ray microanalysis attachments, liquid scintillation counter, gamma counter, refrigerated centrifuges, ultra-centrifuge, coulter counters, gas-liquid chromatographs, HPLC, atomic absorption spectrophotometer, UV spectrophotometers, fluorescence spectrophotometer, Nikon drawing and photomacrographic equipment, inverted microscope, fluorescence microscope, differential interference-contrast microscope, CO2 incubators, analytical balances, Gilson respirometer, video equipment, freeze dryer, electrophoresis equipment, ultra-low temperature, freezer, autoclaves, nutrition analytical equipment, laminar-flow sterile cabinets, physiographs, oscilloscopes, column chromatography equipment, stereotaxic equipment.

Aquarium facilities

Species maintained for experimental purposes:

Oreochromis mossambica	*Penaeus indicus*	*Macrobrachium lanchesteri*
Poecilia reticulata	*Drosophila melanogaster*	*Trionyx sinensis*
Plutella xylostella	*Mus muscullus*	*Rattus rattus*
Tenebrio sp.	*Hymenolepis diminuta*	*Rotifera*
Artemia sp.	*Siganus canalicatus*	*Oryzias javanicus*
Oryzias latipes	*Colisa labia*	*Onchidium sp.*

Research craft

Name:	PERIOPHTHALMUS
Owner:	Zoology Dept.
Length:	9 m.
Type:	bumboat (wood)
Date of construction:	1959
Crew:	2
Scientists:	17

Institution code: 000001 Information received: 28/11/83

Ministry of the Environment (ENV)

Executive officer LEE Ek Tieng: Permanent Secretary

Postal Address

Ministry of the Environment (ENV)
Princess House, Alexandra Road
SINGAPORE 0315

Telephone: 635111
Telex: RS 34365
Cable: MINENVIRON

Working languages
English

Nature of institute
Governmental

Main fields of activities
Pollution
Engineering
Education, Training or Extension

Areas of speciality
Offshore Marine Waters
Coastal Marine Waters
Brackish Waters
Inland (Fresh) Waters
Petroleum Hydrocarbons
Metals
Halogenated Hydrocarbons

Objectives and programmes
History of institution, its mandate and purpose

The Ministry of the Environment was formed in September 1972, by absorbing from the Ministry of Health and the Ministry of National Development, those departments which provided for or dealth with environmental health services and pollution control in the Republic of Singapore. The Ministry regulates, enforces and provides services in all the areas of speciality mentioned above. Its activities are geared towards the maintenance of a high standard of environmental public health and water pollution control. The objectives of the Ministry are to maintain a clean and healthy environment. It is the authority on all matters relating to land-based pollution and co-ordinates marine and air pollution matters. It also develops, operates and maintains infrastructure for collection, treatment and disposal of wastewater and solid waste and controls epidemics of infectious diseases.

Research, monitoring and other activities in the last three years

- Remedial action to clean up polluted Singapore River, Kallang basin and all other water catchments
- Resiting of street hawkers into proper premises to improve hygiene and prevent water pollution
- Planning, design and construction of new treatment works, sewer lines, pumping stations to achieve population served by modern sanitation of 85 percent in 1984
- Reconstructing major drains to alleviate flooding due to intensified land development
- Occurence of filamentous microorganisms in activated sludge at Bedok, Kim Chuan and Ulu Pandan Sewage Treatment Works
- The bacteriological assessment of the quality of water in Kallang River, Singapore River and Alexandra Canal
- The effect of the temperature of incubation and recovery media on the determination of total bacteria count for sewage and polluted water
- Studies into the removal of phenol by activated sludge treatment process
- The use of hypochlorite to prevent bulking of activated sludge

Major current research and other activities

- The study of microorganism cultures from aeration units using surface aeration and those using compressed air aeration
- The bacteriological assessment of the quality of water in Bukit Timah/Rochore Canal
- Survey of the phytoplankton in the Straits of Johore
- Survey of bacteriological quality of sea-water around Singapore and the offshore islands
- Empirical determination of the BOD/TOC ratio for water samples in urban rivers/canals
- Development of methods for detection of pesticides in inland water; PCB's in transformer oil and polyosamaties in seawater using the GCIMS, infrared analyser and spectrafluorometer

Future programmes

- Monitoring of both seawater and inland water for organic pollutants
- The study of the potentially pathogenic microorganisms in chemically treated and untreated sludge

Objectives and programmes (Cont.)

Cooperative programme
- Ministry of National Development, Housing and Development Board and Jurong Town Corporation
  - water pollution development proposals
- Ministry of Health and National University of Singapore
  - bacteriological and chemical analysis of river water samples
  - information on poisons which can be discharged into open watercourses
- Department of Trade
  - control of non-biodegradable detergents
- Public Utilities Board
  - protection of water catchment against water pollution

Training programme
- In-service training facilities
- Practical training attachments for ASEAN materials under ASEAN Training Awards and other developing countries under WHO Training Awards

Institution structure

The Ministry is divied into the following divisions, departments and sections:
- Environmental Engineering Division (Sewerage Department, Drainage Department and Engineering Services Department)
- Environmental Public Health Division (Environmental Health Department, Quarantine and Epidemiology Department, Vector Control and Research Department, Training and Education Department, Hawkers Department, Cemeteries and Crematoria Section and Food Section)
- Finance and General Administration Division

Staff

150 Professional staff 821 Technical staff 6310 Other staff

Professional scientific staff:

Name	Degree	Speciality
Tok Gek Chong	M.Ph.	Chemistry, Inorganic chemistry
Seah Huay Leng (Ms)	M.Sc.	Chemistry
Somluck Awyong (Ms)	M.Sc.	Biology, Bacteriology
Chia Hong Kuan	B.Sc.	Chemistry
Chu Sin-I	M.Sc.	Biology, Food science and technology
Tan Li Lin (Ms)	M.Sc.	Food science
Selena Wong Ka Tai	M.Sc.	Pollution control
Dr So Kwo Keung	Ph.D.	Chemistry
Susan Chong Yuen Mei (Ms)	M.Sc.	Pollution control
Indrani d/o Chidambaram (Ms)	B.Sc.	Chemistry

Premises/facilities

Building area: 4200 m² Laboratory area: 167 m²
With facilities for:
Visiting Scientists: 1 Students: 2

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 2700
Number of periodical subscriptions: 27

Equipment

Atomic absorption spectrophotometer (Varian Techtron Model 1200 with Carbon Rod Atomizer CRA-90), total organic carbon analysers (Beckman Model 915, Beckman Model 915 B Tocamaster), spectrophotometer (Spectronic 20 Bausch and Lomb), pH meter (Pye Model 292), portable pH/meter (Orion 399A), auto-titrimeter (Fisher Model 36), dissolved oxygen meter (YSI Model 54), nephelometer (EEL Model 53), SCT meter (salinity, conductivity and temperature, YSI Model 33), auto-analyzer (Technicon Auto-Analyzer II), infrared spectrophotometer (Pye Unicam Model SP3-200), gas chromatograph/mass spectrometer (Hewlett Packard Model 5995-B), micro-processor ionalyzer (Orion Model 901), luminescence spectrometer (Perkin Elmer Model LS-5), portable pH meter (Beckman Chem-Mate Model 72), tintometer (Lovibond)

Institution code: 000002 Information received: 29/06/83

Port of Singapore Authority (PSA)

Executive officer KUTTAN Chitharanjan: Deputy Port Master

Postal Address

Port of Singapore Authority (PSA)
7B, Keppel Road 20-07
P.O. Box 300
SINGAPORE 0208

Telephone: 2217711
Telex: RS 34970
Cable: TANJONG SINGAPORE

Working languages
English

Nature of institute
Governmental

Main fields of activities
Oceanography
Pollution

Areas of speciality
Tide / Waves
Petroleum Hydrocarbons
Halogenated Hydrocarbons
Coastal Marine Waters
Metals
Radionuclides

Objectives and programmes
History of institution, its mandate and purpose
The Port of Singapore Authority (PSA), was established on 1 April 1964. The PSA is responsible for the administration of The Prevention of Pollution of the Sea Act of 1971 and to tackle the problems of marine pollution in the country. Apart from conducting regular observations on different physical processes in the seas around the islands, e.g. hydrographic surveys, tides/tidal streams (harmonic analysis), it has established its own chemistry laboratory in 1975. The activities are oriented towards protection of the marine environment around the island. The objectives of PSA is to monitor regularly oil, pesticides, heavy metals, dangerous chemicals and radioactivity in the seas around Singapore and occurrence and concentration of poisonous gases in the holds of vessels.

Major current research and other activities
Being mostly a control laboratory it does not have any research programme of its own. The main concern on marine pollution is oil spills as Singapore lies along the main tanker route. Frequency of hydrographic surveys of the area and nautical publications are consistent with the marine requirements in the Singapore waters and developments in the port waters.
- Regular monitoring on oil pollution, dispersants and a few heavy metals in port waters
- Harmonic analyses of tides/tidal streams

Future programmes
Continuation of current programme and other activities.
- To acquire telemetring system to measure currents, salinity and temperature

Cooperative programme
The PSA is one of the institutions responsible to the Ministry of the Environment on matters pertaining to marine environment.

Institution structure
The Authority consists of the following departments:
- Port Master's: Enforcing The Prevention of Pollution of the Sea Act, 1971
- Hydrographic: Hydrographic surveys, tides/tidal streams analysis and prediction, publication of nautical charts and tide tables and notice to mariners.
- Chemistry: Certification of gas free vessels and matters on dangerous cargo onboard vessels
- Fire and Safety: Anti oil pollution operation at sea

Staff

Professional scientific staff:

Name	Degree	Speciality
Phang Sing Eng		Deputy director (Sc. Services)
Wilson Chua Ngiap Foo		Hydrographer

Research craft

Research craft (Cont.)

Name:	MATA IKAN
Owner:	PSA
Date of construction:	1967
Crew:	6

Name:	DISCOVERY
Owner:	PSA
Date of construction:	1980
Crew:	4

Name:	INVESTIGATOR
Owner:	PSA
Date of construction:	1980
Crew:	4

Name:	UTARA
Owner:	PSA
Date of construction:	1967
Crew:	4

Institution code: 000003 Information received: 29/07/83

Aquaculture Unit, Primary Production Department, Ministry of Education (AQU, PPD)

Executive officer CHEONG Leslie John: Head

Postal Address

Aquaculture Unit, Primary Production Department,
Ministry of Education (AQU, PPD)
300 Nicoll Drive, Changi Point
SINGAPORE 1749

Telephone: 5452124/5451592/5451625
Telex: PPD RS 28851
Cable: AGRIVET, SINGAPORE

Working languages
English

Nature of institute
Governmental

Main fields of activities
Aquaculture

Areas of speciality

Demersal Fish	Pelagic Fish
Shrimps / Prawns	Other Invertebrates
Micro-organisms	Coastal Marine Waters

Objectives and programmes
The mission of the unit is to increase fish production in Singapore through aquaculture. Research: fish breeding; nutrition and disease studies; shellfish culture (incl. postharvest operations); fish quarantine studies; monitoring of environmental parameters (water quality); advisory services to farmers.

Cooperative programme
- International Development Research Centre (IDRC) of Canada: Project on intesive fish culture (Phase II: 1981-1983)
- ASEAN/Australia: Project on fish quarantine (1983-1985)
- SEAFDEC Aquaculture/Singapore: Aquaculture Studies (1980 continuous)

Training programme
- In-service training (e.g. on disease/pathology; analytical techniques; on feed analysis, etc.)
- Overseas training under cooperative programmes and other scholarships

Institution structure
The Unit is divided in:
- Administration
- Brood-stock Upkeep
- Hatchery and Micro-organism Culture
- Environmental Studies
- Nutrition Studies
- Disease and Quarantine Studies
- Production Studies

Staff
3 Professional staff 7 Technical staff 67 Other staff

Professional scientific staff:

Name	Degree	Speciality
Leslie John Cheong	B.Sc.(Hons)	Mussel culture
Lim Lian Chuan	B.Sc.(Hons)	Fish breeding
Renee Chou (Ms)	B.Sc.(Hons)	Fish nutrition
Chao Tien Mee	B.Sc.(Hons)	Fish disease
Lee Hoe Beng	B.Sc.(Hons)	Fish breeding
Goh Siang Keng	B.Sc.	Fishing gear
Heng Hock Heang	M.Sc.	Fish larval rearing
Lee Yeng (Miss)	B.Sc.	Fish culture (general)
Wong Farn Juin (Miss)	B.Sc.(Hons)	Fish culture (general)
Chiam Chai Seng	Master Fisherman	Fishing operation
Chong Yen Chung	Ph.D.	Fish disease

Premises/facilities
Building area: 2113 m² Laboratory area: 1233 m²

Information facilities
Library holdings:
Number of periodical subscriptions:5

Equipment
Microscopes, centrifuge, turbidity meter, oxygen meter, pH meter, ammonia meter, ovens.

Aquarium facilities
Total area: 15000 m² Number of tanks: 230

Organisms maintained:
Demersal Fish Pelagic Fish Crustaceans
Micro-organisms

Species maintained for experimental purposes:

Epinephelus tauvina	*Lates calcarifer*	*Lutjanus johnii*
Lutjanus altifrontelis	*Chromileptis altivelis*	*Siganus canaliculatus*
Tetraselmis sp.	*Perna viridis*	*Penaeus merguiensis*
Penaeus monodon	*Brachionus plicatilis*	*Skeletonema sp.*
Chaetoceros sp.	*Chlorella sp.*	

Research craft
Name: PPD FISH FARM
Owner: Dir. Primary Production Department
Length: 40 m.
Type: floating raft
Date of construction: 1978
Crew: 9
Scientists: 1
Special facilities:
Net-cages for fish holding/culture

Name: PPD FISH FARM
Owner: Dir. Primary Production Department
Length: 40 m.
Type: floating raft
Date of construction: 1979
Special facilities:
Net-cages for fish holding/culture

Name: PPD MUSSEL RAFT
Owner: Dir. Primary Production Department
Length: 15 m.
Type: floating raft
Date of construction: 1979
Special facilities:
Mussels suspended on ropes

Name: PPD MUSSEL RAFT
Owner: Dir. Primary Production Department
Length: 15 m.
Type: floating raft
Date of construction: 1979

Name: DINGHIES (1-6)
Owner: Dir. Primary Production Department
Type: dinghies (3-8m)

Institution code: 000007 Information received: 10/01/84

Department of Scientific Services (DSS)

Executive officer DUTT Manesh Chandra: Director

Postal Address

Department of Scientific Services (DSS)
Outram Road
SINGAPORE 0316

Telephone: 2218411

Working languages
English

Nature of institute
Governmental

Main fields of activities
Chemical Sciences
Physical Sciences
Pollution

Areas of speciality
Metals
Halogenated Hydrocarbons
Radionuclides

Objectives and programmes
History of institution, its mandate and purpose
The department was established in 1907 as the Government Analyst's Department. In 1939 the name was changed to the Department of Chemistry. In 1957, the Inspectorate of Dangerous and Hazardous Materials was combined with the Department of Chemistry. The Department's name was changed again to Department of Scientific Services in 1976, in view of the diversification of functions into radiation protection, microbiology, chemical engineering and food technology. Since coming under the Ministry of Health in 1981, its Microbiology Section was transferred to the Department of Pathology. The Department provides scientific services required by government departments for their programmes. Its facilities are also available to individuals and industries on payment of fees. Apart from services, the Department conducts in-house research to update techniques. Being a service-oriented organization its activities are spread over various fields including environmental pollution. It carries out analyses either on request from other government organizations or on payment from individuals and industries.
Research, monitoring and other activities in the last three years
Research on chlorinated hydrocarbons and heavy metals.
Major current research and other activities
Metals such as As, Be, Fe, Hg, Cd, Cr, Cu, Pb, Ni, Ag and Zn are monitored at regular intervals and their concentrations in water, sewage and effluents are strictly controlled.
Dust and fume samples collected on cellulose acetate filters are analysed by atomic absorption spectroscopy for their concentration of Pb, Cd, Mn, Cu, Fe, Zn, Ni and Cr. Whole blood samples of industrial workers are measured regularly for Pb, Cd and Mn.
The working environment in industries are monitored for benzene, vinyl chloride, trichloroethylene, pyridine, ethanol, isopropyl alcohol and chloroform, etc. Residues of pesticides, both the permitted and the non-permitted types, are occasionally measured in different media.
Analysis of Pb and S contents in automotive fuels. Determination of reactive hydrocarbons (C2-C6) in the atmosphere.
Future programmes
Same as in the last three years
Continuation of current programme
Training programme
- Post-graduate course (M.Sc. Public Health Chemistry)
- Colombo Plan Junior Fellowships (for training of technicians)

Institution structure
The Department is divided in the following sections (and units):
- Food science (Food and Customs)
- Environmental science (Water, Industrial Pollution, Industrial Toxicology, Miscellaneous)
- Pharmaceutical science(Pharmaceutical Chemistry, Regulatory Drug)
- Toxicology (Toxicology, Urine Testing, Document Examination)
- Forensic science (Forensic, Narcotics)
- Radiation science (Enforcement, Services)

Staff
28 Professional staff 85 Technical staff 27 Other staff

Professional scientific staff:

Name	Degree	Speciality
Dutt, M.C.	M.Sc.	Analytical chemistry
Chua, Teck Hock	M.S.	Corrosion science
Theng, Chye Yam	M.Sc.	Food science
Lim, Han Yong	B.Sc.(Hons)	Analytical chemistry
Chng, Beng Han	B.Sc.	Scientific doc. examination
Starkey, Clive	M.Sc.	Radiation science
Ng, Tju Lik	Ph.D.	Physical chemistry, Analytical chemistry, Pharmaceutical chemistry
Teo, Teng Poh	B.Sc.(Hons)	Forensic science
Wong, Yew Sin	M.Eng.	Environmental science
Kwok, Sau Fong (Ms)	Ph.D.	Industrial toxicology
Chow, Shui Tse	Ph.D.	Instrumental analysis
Lo, Danny Siaw Teck	Ph.D.	Physical chemistry
Ng, Doris (Ms)	B.Sc.(Hons)	Analytical chemistry
Yap, Bei Sing	M.Sc.	Radiation science
Ng, Gek Kwee (Ms)	M.Sc.	Forensic science, Document examination
Wong, Geok Eng (Ms)	M.Sc.(Pharmacy)	Pharmaceutical chemistry, Pharmaceutical microbiology
Woo, Soo On	Ph.D.	Organic chemistry
Saw, Chwee Guan	Ph.D.	Analytical chemistry
Sam, Cheuck Tatt	Ph.D.	Pharmaceutical chemistry
Tan, Wai Fun (Ms)	B.Sc.(Hons)	Biochemistry
Lee, Tong Kooi	Ph.D.	Organic polymer chemistry
Bloodworth, Bosco Chen	Ph.D.	Inorganic analytical chemistry
Oei Tiong Tjeng	Ph.D.	Physical chemistry
Chan Yeet Chieng (Ms)	M.Sc.	Radiation science
Phua Tan Tee	Ph.D.	Radiation science

Premises/facilities
Building area: 2214 m² Laboratory area: 1338 m²
With facilities for:
Visiting Scientists: 1 Students: 6

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 2000
Number of periodical subscriptions:85

Monographs and serials titles:
- Annual Report of Department of Scientific Services
- Scientific Services Newsletter

Equipment
The Department has the latest equipment, such as GC/MS, HPLC, automatic UV-VIS spectrophotometer, AAS with flameless attachment Hg analyser, GLC with ECD, TCD and FID, RI spectrophotometer, 1024-channel analyzer with minicomputer for radioactivity, X-ray fluorescence analyser, etc.

Institution code: 000008 Information received: 31/05/83

Marine Fisheries Research Department, Southeast Asian Fisheries Development Center (MFRD/SEAFDEC)

Executive officer HOOI Kok Kuang: Chief of Department

Postal Address

Marine Fisheries Research Department,
Southeast Asian Fisheries Development Center (MFRD/SEAFDEC)
Changi Fish. Complex, Changi Point
SINGAPORE 1749

Telephone: 5452124/5451592/5451625
Cable: SEAFDEC SINGAPORE

Working languages
English

Nature of institute
Inter-Governmental

Main fields of activities

Marine Fisheries	Food Sciences / Food Technology
Quality Control (fishery Products)	Microbiology
Mutual Assistance / Technology Transfer	Education, Training or Extension

Areas of speciality

Demersal Fish	Pelagic Fish

Objectives and programmes

History of institution, its mandate and purpose
Established in 1969 to perform fisheries research in Southeast Asia 1969-1978 fisheries resources evaluation, oceanography, fishing ground development and training of fisheries biologists.

Research, monitoring and other activities in the last three years
1979-1983 fisheries post-harvest technology, utilisation of low market value resources, quality assessment of frozen fish, training of fisheries technologist and technicians, extension services to fish processors in Southeast Asia, transfer of processing technology to fish processors in the region.

Major current research and other activities
Same as in the last three years

Cooperative programme
MFRD is one of SEAFDEC's 3 Departments. The other two are:
- Training Department, Bangkok (Training of fishing personnel and marine fisheries research)
- Aquaculture Department, Iloilo (Research, development and training in aquaculture)

Member Countries: Singapore, Malaysia, Philippines, Thailand and Japan.

Training programme
- Training course in Post-harvest Technology for fisheries technologists: 2 weeks/twice a year - fish processing and quality assessment
- Training course in Post-harvest Technology for fisheries technicians: 2 weeks/1-2 times a year - fish processing
- Demonstration courses for fish processors in Southeast Asia
- Ad-hoc 3-4 day courses for fish processors

Institution structure

The Department is divided in:
- Post-harvest Technology (Processing, Laboratory, Wet Fish Handling and Preservation, Training and Extension)
- General Affairs (Administration, Finance, Library, Stores)

Staff

11 Professional staff 5 Technical staff 7 Other staff

Professional scientific staff:

Name	Degree	Speciality
Hooi Kok Kuang	M.Sc.	Chief
H. Hasegawa	Ph.D.	Deputy Chief
N. Tsukada	Ph.D.	Fish preservation
T. Fujiwara	B.Sc.	Fish processing
K. Iino	B.Sc.	Food science
Tan Sen Min	B.Sc.Hons.	Fish processing
Ng Cher Siang	Ph.D.	Quality assessment of fish
Lim Pang Yong	B.Sc.Hons.	Fish biochemistry
Ng Mui Chng (Ms)	B.Sc.	Fish processing
Low Lai Kim (Ms)	B.Sc.Hons.	Fish preservation
Lam Chee Phang	B.Sc.	Fishing technology

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 17889
Number of periodical subscriptions:20

Monographs and serials titles:
Tan, S.M. et. al. 1982. A Colourguide to the fishes of the South China Sea and the Andaman Sea. Singapore, Primary Production Dept. and MFRD, 45 pp.

Equipment
Beckman refrigeration centrifuge, gas chromatograph, spectrophotometer, microwave moisture determination, refrigerated incubators (-20, -40, -60 grade C.), Tecator protein determination system, bacteriological cabinets, sterilisation hoods, fume hoods, autoclave, autostill (distilled water), glassware washer (ultrasonic)
- Equipment for processing of surimi (frozen fish minced), (meat-bone separator, fish handling and gutting machine, fish meat strainer, screw press, hydraulic press, fish washer)
- Fish jelly product processing equipment (grinder, forming machines, water baths, deep fryer, baking equipment, battering and breading equipment)
- Freezing facilities (contact freezer, blast-freezer -30 grade C, cold store -20 grade C).

Institution code: 000009 Information received: 23/01/84

สถานีประมงน้ำกร่อย จังหวัดระยอง

Rayong Marine Fisheries Station

Executive officer TAWEESITH Tongsueb: Chief Officer

Postal Address

Rayong Marine Fisheries Station
BAN PAE 21160, RAYONG PROVINCE

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities

Marine Fisheries	Fishing Technology
Aquaculture	Education, Training or Extension

Areas of speciality

Demersal Fish	Pelagic Fish
Other Vertebrates	Cephalopods
Shrimps / Prawns	Other Invertebrates
Algae	Coastal Marine Waters
Brackish Waters	Coral Ecosystems

Objectives and programmes

History of institution, its mandate and purpose
The Station was established in 1953 to extend coastal fisheries and to help the fishermen in the field of fishing gears, hatchery and aquaculture. Rayong Marine Fisheries Station is under the Division of Marine Fisheries, Fisheries Department, Ministry of Agriculture and Cooperative.

Research, monitoring and other activities in the last three years
Monitoring surveys on Thai fishing gears and fishing gears development. Marine cageculture, marine fish hatchery and seed production. Research and monitoring on artificial reefs.

Major current research and other activities
Fishing gears development, artificial reef in the coastal water, marine fish hatchery and seed production and marine fish cages culture.

Future programmes
Continuation of current programme

Cooperative programme
Small-Scale Fisheries Development Project Ban AoMaKham Pom, Rayong Province (Joint project of the Canadian International Development Agency and Fisheries Department, Thailand)

Training programme
Giving field training on fisheries for the students of Agriculture College, Faculty of Fisheries, and for the staff of other units of the Department of Fisheries.

Institution structure

Basic organizational structure of the Station is:
- Administration Unit
- Fishermen Services (Slipway/dock/and sea accident)
- Development and Extention of Fishing Gears
- Mariculture (Research; Propagation)
- Smallscale Fisheries Development (Marine Fishes Cage Culture; Fishing Ground Development)

Staff

7 Professional staff 2 Technical staff 70 Other staff

Professional scientific staff:

Name	Degree	Speciality
Tongsueb Taweesith	B.Sc.	Marine resources research
Pravim Vootisin	B.Sc.	Marine fish breeding
Somporn Boonkerd	B.Sc.	Fishing gears (extension)
Aussanee Munprasit	M.Sc.	Fishing gears (development)
Tanin Singhakaiwan	B.Sc.	Marine fishes (cage culture)
Saowanee Musigaratana (Ms)	B.Sc.	Fish food production
Ratana Maneenava (Ms)	B.Sc.	Seed production

Premises/facilities

Building area: 9972 m² Laboratory area: 84 m²

Information facilities

Monographs and serials titles:
- Annual Report, 1981
- Experimental Report (Liftnet fishing gears)
- Experimental Report (Squid dipnet in Thailand)
- Experimental Report (Fish apartment)
- Experimental Report (Artificial breeding of Siganids)

Equipment
Salinometer, stereomicroscope, pH meter, aqualung (4), speed boat, fiberglass boat, wood boats (2).

Aquarium facilities
Total area: 17487 m² Number of tanks: 95

Organisms maintained:

Demersal Fish	Other Vertebrates	Molluscs
Crustaceans	Other Invertebrates	Algae

Species maintained for experimental purposes:

Chlorella spp. *Brachionus plicatilis* *Lates calcarifer*
Lutianus argentimaculatus *Eleutheronemus tetradact.* *Epinephelus tauvina*
Polyphagus spp.

Research craft
Name: PRAMONG 12
Owner: Division of Marine Fisheries
Type: Stern trawler
Crew: 7
Scientists: 1
Special facilities:
Echosounder, single side band communication radio, mechanical winch for trawler, 5 KVA electric generator.

Name: MFS 1
Owner: Rayong Marine Fish. Station
Length: 10 m.
Type: Carrier boat
Crew: 2

Name: MFS 9
Owner: Rayong Marine Fish. Station
Length: 15 m.
Type: Research vessel
Crew: 5
Scientists: 1
Special facilities:
Echosounder, single side band communication radio, 25 KVA electric generator, 3 H.P. electric winch.

Name: MFS 11
Owner: Rayong Marine Fish. Station
Length: 12 m.
Type: Research vessel
Crew: 4
Scientists: 1
Special facilities:
Echosounder

Institution code: 000030 Information received: 04/11/83

กรมอุทกศาสตร์ กองทัพเรือ

Hydrographic Department, Royal Thai Navy

Executive officer TRIPECH Tawatchai: Vice-Admiral (Director)

Postal Address

Hydrographic Department, Royal Thai Navy
Arunamarin street
BANGKOK 6

Telephone: 4650522
Cable: HYDRO BANGKOK

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities
Oceanography
Meteorology / Climatology
Pollution

Areas of speciality
Metals
Nutrients

Objectives and programmes
History of institution, its mandate and purpose
The Department was established on 16 January 1922 with the purpose to perform hydrographic surveys, aids to navigation, oceanographic studies and surveys and marine meteorology.
Research, monitoring and other activities in the last three years
Oceanographic surveys and pollution monitoring in the Gulf of Thailand.
Major current research and other activities
Same as in the last three years
Future programmes
Five years programme of oceanographic surveys in Thai waters.
Cooperative programme
- Department of Marine Sciences, Chulalongkorn University (Pollution studies)
- National Environment Board (Sediment transport)
- National Research Council
- Ministry of Communication (Oceanographic surveys)

Institution structure
The Department is divided into 9 divisions:
- Surveying Division
- Cartographic Division
- Technical Division
- Surveying Vessels Division
- Aids to Navigation Division
- Maritime Security Division
- Meteorological Division
- Oceanographic Division (divided into Chemical Oceanography, Physical Oceanography, Tidal and Marine Biology sections)
- Administrative Division.

Staff
10 Professional staff 32 Technical staff 7 Other staff

Professional scientific staff:

Name	Degree	Speciality
Bhumisawadi, V.	B.Sc.	Physical oceanography
Pochanasomburana, P.	M.Sc.	Physical oceanography
Charaeonlaph, T.	M.Sc.	Physical oceanography
Neelasri, C.	M.Sc.	Physical oceanography
Punpruk, V.	M.Sc.	Physical oceanography
Tapananond, S.	B.Sc.	Physical oceanography
Umnuay, G.	M.Ph.	Chemical oceanography
Buothep, C.	B.Sc.	Geology
Chareondee, T.	B.Sc.	Marine biology
Chotibut, V.	B.Sc.	Biology

Premises/facilities
Building area: 3200 m² Laboratory area: 40 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 15000
Number of periodical subscriptions: 10

Equipment
Current meters, tide gauges, reversing thermometers, STD, DO meter, spectrophotometer, flame analyser, pH meters, spectrofluorometer, salinometers, centrifuges, analytical balances.

Research craft

Name: OCEANOGRAPHIC VESSEL I
Type: vessel
Date of construction: 1955

Name: OCEANOGRAPHIC VESSEL II
Type: vessel
Date of construction: 1955

Name: OCEANOGRAPHIC VESSEL III
Type: vessel
Date of construction: 1972

Name: H.T.M.S. CHANDHARA
Type: Map surveying
Date of construction: 1961

Name: H.T.M.S. SURIYA
Type: Aids to navigation
Date of construction: 1979

Name: H.T.M.S. SUK
Length: 63 m.
Type: oceanog. vessel
Date of construction: 1981
Crew: 57
Scientists: 30
Lab. space: 30 m2
Special facilities:
satellite navigation system, radar, echosounder, weather facsimile, vibro corer, sub-bottom profiler, geophysical instruments.

Institution code: 000031 Information received: 01/10/83

สถานีประมงทะเล จังหวัดภูเก็ต

Phuket Marine Fisheries Station (PMFS)

Executive officer CHIRASTIT Chareen: Director

Postal Address

Phuket Marine Fisheries Station (PMFS)
77, Sakdidej
P.O. Box 13
MUANG, PHUKET

Telephone: 211589/211889
Cable: PHUKET FISH STATION

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities

Marine Fisheries	Resources Management
Fishing Technology	Aquaculture
Marketing / Economics	Social Sciences

Areas of speciality

Demersal Fish	Coastal Marine Waters
Brackish Waters	

Objectives and programmes

History of institution, its mandate and purpose
The PMFS is under Marine Fisheries Division, Department of Fisheries, Ministry of Agriculture and Cooperatives, founded in 1963 to carry out the monitoring surveys and biological studies of demersal fishes along the West Coast of Thailand.

Research, monitoring and other activities in the last three years
Research on bio-history and behavior of marine fishes, monitoring surveys, stock assessment, fishing gear development and mari-culture.

Major current research and other activities
Same as in the last three years
- and research on shared stocks by tagging programme of *Rastrelliger brachysoma* from south of Phuket to the Thai-Malaysian jurisdiction. Experiment on building up 100 points of fish traps in Phangnga Bay
- Pole and line tuna fishing demonstration and training
- Hatching and rearing experiments with *Epinephelus tauvina*
- Surveys on the fishery resources and socio-economics of the fishing villages along the west coast of Thailand

Future programmes
Same as in the last three years
Continuation of current programme
- and expansion of the new substation for pen and cage culture

Cooperative programme
- Marine Fisheries Division (Fish stock assessment and problems in mariculture)
- Rayong Fisheries Station (Mariculture and fish traps)
- Penang Marine Laboratory (Pelagic fishes tagging programme)
- Phuket Brackish-Water Fisheries Station (Mariculture)

Training programme
- Graduate courses in mariculture and fishing gear development for national university and college students

Institution structure
The Station is divided into following sections:
- Marine Fisheries Extension and Conservation
- Marine Fisheries Surveys and Research
- Mariculture

Staff
10 Professional staff 5 Technical staff 3 Other staff

Professional scientific staff:

Name	Degree	Speciality
Chareen Chirastit	B.Sc.	Marine fisheries management
Niyom Lohakarn	B.Sc.	Fishing gear development, Construction of fish traps
Udom Bhatia	B.Sc.	Stock assessment
Jate Pimoljinda	B.Sc.	Mariculture
Thawatchai Chantawong	B.Sc.	Monitoring surveys
Pairoh Suthakorn	B.Sc.	Distribution of pelagic fish
Veera Boonragsa	B.Sc.	Status of marine fisheries
Nipawan Boosarawich (Ms)	BM.Sc.	Plankton culture
Kawi Saranakomkul	B.Sc.	History (Rastrelliger spp.)

Staff (Cont.)

Name	Degree	Speciality
Peera Aosomboon	M.Sc.	Small-scale fishing gear dev.
Boonsri Wongchitsue (Ms)	B.Sc.	Bio-history of pelagic species

Premises/facilities
Building area: 375 m² Laboratory area: 80 m²
With facilities for:
Visiting Scientists: 4 Students: 15

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1800
Number of periodical subscriptions:5

Monographs and serials titles:
- Status of Coastal Fisheries on the West Coast of Thailand, 1980 (English, on Exchange)
- The Present Status of Pelagic Fisheries on the West Coast of Thailand, 1982 (English, on Exchange)
- Experiment on Purse Seining for Live - bait, 1980 (Thai, with Abstract)
- Distribution and abundance of Tuna Bait Species on the Indian Ocean Coast of Thailand, 1980 (Thai, with Abstract)
- Preliminary results of pole and line fishing off the west coast of Thailand, 1980 (English, on Exchange)

Equipment
Photographic equipment, microscope, pH meter, 3 salinometers, analytical balance, 2 diving equipment with compressor, under-water camera, deep freezer, 3 desicators, binoculars, air compressor, centrifuge, 2 calculators, autoclave, feed blender.

Aquarium facilities

Species maintained for experimental purposes:

Chlorella sp.	*Chaetoceros sp.*	*Tetraselmis sp.*
Brachyonus plicatilis	*Portunus pelagicus*	*Scylla serrata*
Rastrelliger brachysoma	*R. kanagurta*	*Decapterus spp.*
Sardinella spp.	*Caranx crumenopthalmus*	*Epinephelus tauvina*
Lutianus argentimaculatus	*Caranx mate*	*Auxis thazard*
Euthynnus affinis	*Thunnus tonggol*	*Nemipterus spp.*
Sillage spp.		

Research craft

Name: PRAMONG 10
Owner: Department of Fisheries
Length: 24 m.
Type: Vessel
Date of construction: 1975
Crew: 10
Scientists: 2
Lab. space: 4 m2
Special facilities:
Echosounder, hydraulic winch, oceanographic winch, radar, satellite navigation system, VHF radio equipment, oceanographic instruments and different fishing gears.

Name: PRAMONG 3
Owner: Department of Fisheries
Length: 21 m.
Type: Trawler
Date of construction: 1958
Crew: 8
Scientists: 2
Lab. space: 4 m2
Special facilities:
Echosounder, hydraulic winch, radar, VHF radio equipment and different fishing gears.

Name: So.Po.To.
Owner: Department of Fisheries
Length: 11 m.
Type: Wooden boat
Date of construction: 1978
Crew: 4
Scientists: 1
Lab. space: 4 m2
Special facilities:
VHF radio equipment

Institution code: 000032 Information received: 15/06/83

สถาบันเพาะเลี้ยงสัตว์น้ำชายฝั่งแห่งชาติ จังหวัดสงขลา สพช.

National Institute of Coastal Aquaculture (NICA)

Executive officer BROHMANONDA Pairoj: Director

Postal Address

National Institute of Coastal Aquaculture (NICA)
Kaosan, Soi 1
SONGKHLA

Telephone: 074-311895

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities
Biological Sciences
Food Sciences / Food Technology
Limnology
Pollution
Education, Training or Extension
Resources Management
Aquaculture
Microbiology
Marketing / Economics

Objectives and programmes
History of institution, its mandate and purpose
Established in April 1974 as Songkhla Marine Fisheries Station was renamed in February 1981 as National Institute of Coastal Aquaculture, Department of Fisheries, Ministry of Agriculture and Cooperatives. The objectives of the Institute are to develop coastal aquaculture and fisheries resources, conservation of the west coast of the gulf of Thailand and of the southern part of Thailand.

Research, monitoring and other activities in the last three years
Coastal Aquaculture Research:
- Experiments on cage culture of red snapper (*Lutianus argentimaculatus* Foskal) with various feeds
- Preliminary studies on parasites of brackish water fisheries
- Preliminary observations on the effects of salinity of water changes on *Penaeus monodon* and *P. merguiensis*
- Experiments on cage culture of sea bass (*Lates calcarifer* Bloch) in the various stocking rates
- Experiments on rearing of banana prawn (*Penaeus merguiensis* de Man) with mixed feed in the pond
- Experiments on rearing of jumbo tiger prawn (*Penaeus monodon* Fabricius) with mixed feed in the pond
- Experiments on cages culture of sea bass (*Lates calcarifer* Bloch) with mixed feed

Seed Production:
- Experiments on shrimp fry from mysis stage to post larva 5 with some brackishwater copepods
- Experiments on nursery of shrimp, post larval stage with mixed feed
- Experiments on culture of seabass fry (*Lates calcarifer* Bloch) with some brackishwater copepods
- Experiments on rearing of sea bass fry at the age of 15 days with mixed feed
- Experiments on nursery of sea bass fry with different salinity levels
- Experiment on culture of freshwater prawn fry with mixed feed
- Experiments on rearing of freshwater prawn fry with brackishwater copepods
- Experiments on culture of shrimps for spawners

Coastal Aquaculture:
- Investigations on distribution and abundance of grouper (*Epinephelus tauvina*) at Pattani Bay
- Investigations on distribution and abundance of *Gracillaria sp.* in Pattani Bay

Conservation and Improvement of Reservoirs:
- Study on the distribution of primary production in Songkhla Lake with estimates of the fisheries potential
- Study on the gill net fisheries in Songkhla Lake with special relation to the water quality and other environmental characteristics

Extention:
- The production and economic aspects of net - cage culture of sea bass (*Lates calcarifer* Bloch)
- Comparison on the production and income of traditional shrimp farm and additional shrimp farm
- Production and income of pens culture of giant fresh water prawn (*Macrobrachium rosenbergii* de Man)

Objectives and programmes (Cont.)

Major current research and other activities
- Mass seed production of sea bass, grouper, prawn, red snapper and crab
- Management and improvement of Songkhla Lake
- Culturing of sea bass, prawn and crab
- Fluctuation and distribution of larvae of economic aquatic animals of the Songkhla coastal region
- Socio-economic studies on shrimp and fish farming
- Economic comparison of traditional and intensive shrimp culture

Future programmes
Continuation of current programme

Cooperative programme
- Technical cooperation on coastal aquaculture development between Thai and Japanese Governments
- Technical cooperation with IDRC programme on sea weeds utilization

Training programme
- Sea bass spawning and larva rearing (annually, during June-July)
- Small scale sea bass culture as poor villages fisheries development programme, (annually, 8 groups a year)
- Coastal aquaculture program for general Thai's fish farmer

Institution structure

The NICA is composed of 6 units:
- Administrative Division
- Coastal Aquaculture Research Division
- Seed Production Division
- Coastal Aquaculture Investigation Division
- Resource Conservation Division
- Coastal Aquaculture Development Division

Staff

20 Professional staff 6 Technical staff 155 Other staff

Professional scientific staff:

Name	Degree	Speciality
Pairoj Brohmanonda	B.Sc.	Fishery
Panit Sungkasem	B.Sc.	Marine science
Chulaporn Ratanachai (Ms)	B.Sc.	Biology
Niwes Ruangpanit	B.Sc.	Fishery
Sujin Maneewong	B.Sc.	Marine science
Thida Pechmanee	B.Sc.	Fishery products
Tanan Tattanon	B.Sc.	Fishery biology
Prakit Kraisingdecha	B.Sc.	Fishery biology
Paitoon Akkayanont	B.Sc.	Aquaculture
Boonsong Sirikul	M.Sc.	Fish nutrition
Supoj Chungyampin	B.Sc.	Aquaculture
Yaowanit Danayadol (Ms)	B.Sc.	Biology
Chaiyuth Chantanachookhin	B.Sc.	Fishery biology
Pairat Korsutharak	B.Sc.	Fishery products
Suchat Techanarawong	B.Sc.	Aquaculture
Vichai Vatanakul	B.Sc.	Aquaculture
Poonsin Panichsuke	B.Sc.	Fishery
Kanit Chaiyakam	B.Sc.	Fishery
Pairoj Sirimontaporn	B.Sc.	Aquaculture
Cherdsang Boontae	B.Sc.	Aquaculture

Premises/facilities

Building area: 6000 m² Laboratory area: 288 m²
With facilities for:
Visiting Scientists: 15 Students: 20

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 1000

Monographs and serials titles:
- Experiments on culture of freshwater prawn (*Macrobrachium rosenbergii* de Man)
- Studies on life history and culture of green mussel (*Mytilus smaragdinus*) at Chonburi coastal area
- Experiments on earthen pond culture of *Penaeus monodon* with various mixed feeds
- The results of fishery by cast net at Inner Songkhla Lake in 1970
- The results from experimental hatchery of banana white shrimp (*Penaeus merguiensis* de Man) in 1973

Equipment

Dissecting microscope, electric incubator, sterilizer, refrigerator, gas table, filtering apparatus, softex, universal homogenizer, paraffin melting apparatus, paraffin spreading apparatus, large sledge microtome, small sledge microtome, freeze

Equipment (Cont.)
for microtome, electro-freeze for microtome, haemacytometer, chest freezer, direct reading analytical balance, electric precision balance, dissolved oxygen meter, pH meter, muffle furnace, Soxhlet's water bath, hydrometer, hot Magmixer, heavy metal eliminator, spectrophotometer, meat grinder, sieve shaker, draft chamber, serum protein refractometer, longtail boats (2), fiberglass boat, motor boats (2).

Aquarium facilities
Total area: 72 m² Number of tanks: 15

Organisms maintained:
Marine Mammals Molluscs Crustaceans
Other Invertebrates Micro-organisms

Species maintained for experimental purposes:

Lutianus argentimaculatus *Epinephelus tauvina* *Lates calcarifer*
Mugil dussumieri *Penaeus monodon* *Penaeus merguiensis*
Macrobrachium rosenbergii *Gracillaria verrucosa* *Gracillaria salicornia*
Porphyra vietnamensis *Porphyra crispata* *Crassostrea lugubris*
Photosus cannius

Research craft

Name:	SONGKHLA I
Owner:	Dept. of Fisheries, Min. Agr. Coop.
Length:	18 m.
Type:	vessel
Date of construction:	1963
Crew:	5
Scientists:	2
Lab. space:	6 m2

Name:	SONGKHLA II
Owner:	Dept. of Fisheries, Min. Agr. Coop.
Length:	9 m.
Type:	vessel
Date of construction:	1968
Crew:	3
Scientists:	1
Lab. space:	5 m2

Name:	None
Owner:	Dept. of Fisheries, Min. Agr. Coop.
Length:	12 m.
Type:	Ferrocement vessel
Date of construction:	1971
Crew:	3
Lab. space:	5 m2

Institution code: 000033 Information received: 07/07/83

สถาบันวิจัยวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย วท.

Thailand Institute of Scientific and Technological Research (TISTR)

Executive officer KAMPEMPOL Smith: Governor

Postal Address

Thailand Institute of Scientific and Technological Research (TISTR)
196 Phahonyothin Road
BANGKHEN, BANGKOK 10900

Telephone: 5791121-30
Cable: TISTR, BANGKOK

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities
Biological Sciences
Ecological Sciences
Resources Management
Limnology
Microbiology
Pollution
Mutual Assistance / Technology Transfer
Social Sciences
Education, Training or Extension

Areas of speciality
Pelagic Fish
Other Vertebrates
Cephalopods
Other Invertebrates
Plankton
Benthos
Coastal Marine Waters
Brackish Waters
Inland (Fresh) Waters
Mangroves Ecosystems
Halogenated Hydrocarbons

Objectives and programmes
History of institution, its mandate and purpose
The Thailand Institute of Scientific and Technological Research (TISTR), a non-profit state enterprise, under the Ministry of Science, Technology and Energy has originated from the Applied Scientific Research Corporation of Thailand (ASRCT, operated in 1964) in accordance with the Applied Scientific Research Corporation of Thailand Act B.E. 2522. TISTR is entrusted with the main task of bringing the results of research to application for the benefit of the economic and social development of the country. This includes conducting research and rendering scientific and technological services to various government agencies and private enterprises. Research is carried out at TISTR with the aim to satisfy the country's need in various fields of development, namely industry, energy, agricultural products, housing and construction, agriculture, environment and resources, maintenance of the equilibrium of ecological system and natural products, especially medicinal plants. The emphasis is on the elevation of socio-economic status in the rural area. The research projects have been undertaken by various research units of TISTR. However, regarding the scientific and technological service, TISTR is responsible for the testing of industrial standard repair and calibration of scientific apparatus and procurement of scientific and technological information and documents. This aims at encouraging and promoting scientific and technological development both in the government and in the private sectors.

Research, monitoring and other activities in the last three years
- Preliminary study for a master plan for development of coastal land
- Environmental resources study of Songkhla Lake Basin
- Ecological studies for conservation of shore birds in Songkhla lake
- Integrated planning for water quality management of the Tachin river
(Note: Only in the coastal areas)

Major current research and other activities
In compliance with the above-mentioned activities, TISTR purports to undertake the following projects:
- Solving the production problems encountered in small and medium size industrial plants
- Industrial investment planning particularly in agro-industry
- Investment planning in agricultural development for export.
- Solving the problems of storage and packaging of agricultural products
- Solving the problems of drainage and waste water control in industrial plants and communities
- Development planning in resources, environmental quality and specific areas of socio-economics

Objectives and programmes **(Cont.)**
- **Assessment of environmental and ecological consequences**
- Development of low-cost housing
- Solving the problems of construction and production of building materials
- Energy-saving in industrial production
- Utilization of agricultural waste products and fuel in producing energy

Future programmes
Continuation of current programme
Cooperative programme
Nature Museum and Forschungsinstitut Senckenberg Frankfurt/Main (Limnology and Fishery)
Training programme
Advisor on master thesis training programme

Institution structure
- Office of Governor
- Office of General Affairs
- Office of Scientific and Technological Service (inter alia Thai National Documentation Center, Analytical Chemistry Laboratory etc.)
- Agricultural Research Division
- Agricultural Product Development Division
- Industrial Research Division
- Pharmaceutical + Natural Products Research Division
- Techno-economic Research Division
- Environmental + Resource Research Division (with Environmental Engineering Laboratory and Resource Survey Laboratory)
- Ecological Research Division (with Environmental Biology Laboratory and Sakaert Environmental Research Station).
- Building Research Division
- Energy Research Programme
- Office of Special Programme

Staff
6 Professional staff 4 Technical staff 9 Other staff

Professional scientific staff:

Name	Degree	Speciality
Lakkhana Boonliang (Ms)	B.Sc.	Ecology of benthos
Lakkhana Pakarnseree (Ms)	M.Sc.	Ecology of plankton
Supachai Sittilert	M.Sc.	Invertebrates taxonomy
Taweewat Polpakdee	B.Sc.	Fish population dynamics
Chaiyuth Klinsukont	B.Sc.	Water quality
Suchart Tekagul	B.Sc.	Water quality

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 110000
Number of periodical subscriptions:70

Monographs and serials titles:
- Annual Report. Thailand Institute of Scientific and Technological Research
- Annual Report. Thai National Documentation Centre
- Building Research and Development Study of Housing, School Building and Related Technology. Aspect and Service
- Directory of Scientific and Technical Libraries in Thailand, 1983
- Housing in Thailand. By Wadanyu Nathalang
- List of Scientific and Technical Literatures Relating to Thailand
- NBRDC's Architectural Catalog File. (In Thai)
- Rural Technology Handbook. (In Thai)
- Scientific Serials in Thai Libraries, Revised Edition
- Thai Abstracts
- Thai National Documentation Centre, Bibliographical Series
  No. 6 Abstracts on Medicinal Plants in Thailand
  No. 7 Selected Bibliography on Biogas
- Treatment of Liquid Wastes of Industrial and Domestic origins (by Sermpol Ratasuk and Chaiyuth Klinsukont)
- TISTR Research News (monthly)

Equipment
5 microscopes, centrifuge, photographic equipments, plankton trap, dredge, water sampler, pH meter, salinometer, oxygen meter, rubber boat.

Institution code: 000034 Information received: 15/06/83

สถาบันประมงน้ำจืดแห่งชาติ สปช.

**National Inland Fisheries Institute,
Department of Fisheries, Ministry of Agriculture (NIFI)**

Executive officer BHUKASWAN Thiraphan: Director

Postal Address

**National Inland Fisheries Institute,
Department of Fisheries, Ministry of Agriculture (NIFI)
Kasetsart University Campus, Phaholyothin Road
BANGKOK 10900**

Telephone: 5790562/5792619/5792151/5794123

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities

Biological Sciences	Ecological Sciences
Inland Fisheries	Resources Management
Aquaculture	Limnology
Microbiology	Pollution
Computer / Information Systems	Education, Training or Extension

Areas of speciality

Pelagic Fish	Shrimps / Prawns
Algae	Micro-organisms
Plankton	Benthos
Inland (Fresh) Waters	Petroleum Hydrocarbons
Metals	Halogenated Hydrocarbons
Pathogenic Micro-organisms	Nutrients

Objectives and programmes

History of institution, its mandate and purpose

The National Inland Fisheries Institute (NIFI) was established in 1975 under the Department of Fisheries, Ministry of Agriculture and Cooperatives. From 1976 it is located in a new modern research laboratory at the campus of Kasetsart University, Bangkok.

NIFI objectives are the following:

- Research on effective culture, development and management of freshwater resources
- Information for protection and restoration of freshwater fishes and their habitats
- Instructing commercial fish farmers and others on techniques for effective fish culture and production of some seed stocks
- Training programme for DOF staff and others as required

Research, monitoring and other activities in the last three years

- Study on parasites of some species of fish from Vachirarongkorn Reservoir (Ms. Supranee Chinabut)
- Study on parasites in the digestive tract of pla chon (*Ophicephalus striatus*) at 3-10 cm. (Ms. Sopa Areerat)
- Freshwater fish induced spawning by using extracted hormone, human chorionic gonadotropin (Ms Somsri Ngamwongchon)
- Culture of breeding of pla chon (*Ophicephalus striatus*) (Manob Tangtrongpairoi)
- An inexpensive fish anaesthetic (Ms. Somsri Ngamwongchon)
- Fisheries survey in Kang-Krachan Reservoir for the management of fish production. (Sompong Hiranwat-Team Leader)
- Study on fisheries aspects for management of fish production in Huoy Yai, Huoy Sawai, Burirum Province and Huoy Ma Tai Chaiyapoom Province (Narong Sukomol-Team Leader)
- Fish landing statistic survey in Pranburi Reservoir, Prachaobkirikhan Province (Ms Angsunee Chantarapakdi-Team Leader)
- Study on fisheries aspects of the lower part of Chao Phya River (Tawan Chookajorn-Team Leader)
- Study on the growth of *Cabomba caroliniana* (Gray) (Ms. Parnsri Chirdchupunseree)
- Systematic study on the fishes of Thai Salaween Basin (Sompote Ukkatawewat)
- Fish population estimation in four irrigation tanks (Tawan Chookajorn-Team Leader)
- Pen culture in reservoir by using water hyacinth as supplementary feed (Sompong Hiranwat-Team Leader)
- Study on some biological character and nutrition values of snake head, *Ophicephalus striatus* in Lum Mae La, Changwat Singhaburi (Sompong Hiranwat-Team Leader)
- Study on fisheries aspects for the management of fish production in Cohk Horm Reservoir Chanwat Procheenburi (Sompong Hiranwat-Team Leader)
- Biology of Pla Kot Lueng *Mystus nemurus* in Srinakarined Reservoir, Kanchanaburi Province (Yothin Leenanond)

Objectives and programmes **(Cont.)**

Major current research and other activities

- Development of micro-algae (*Spirulina*) production (Ms. Jiamjit Boonsom Team Leader)
- Development of *Trichogaster* farming (Ms J. Boonsom Team Leader)
- Study on parasites of some freshwater fish from Sirikit reservoir (Ms. Supranee Chinabut)
- Histological study of some freshwater fishes of Thailand (Ms. Supranee Chinabut)
- Essential water soluble for *Clarias batrachus* fry (Prasert Sitasit)
- Nursing Clarias fry with Moina (Ms. Viratada Sitasit and Vimol Chantarothai)
- Culture of freshwater rotifers (*Brachionus sp.*) with yeast (Ms. V. Sitasit and Ms. Tanaporn Chitapanpong)
- Histological study on the effect of *Aeromonas hydrophila* on *Clarias batrachus* (Ms. Sopa Areerat and Ms. S. Chinabut)
- Utilization of glutamic mother liquor as a fertilizer in fish ponds (Ms. Prayote Paosart)
- Response to selection for body weight in Thai red Tilapia (Ms. Parnsri Chirdchuparnsri)
- Production of red Tilapia in cages culture with different rate (Ms. P. Chirdchuparnsri)
- Systematic study on the fishes of some reservoirs in Thailand (Jaranthada Karnasuta-Team Leader)
- Cataloque of the freshwater fishes of Thailand (Jaranthada Karnasuta-Team Leader)
- Systematic study on the freshwater fishes in Chiew-Larn reservoirs (Jaranthada Karnasuta and Ms. Songpan Soonthornsatit)
- Growth rate comparison of *Sarotherodon niloticus* between male and female in separate and mixed culture with different density in cage (Ms. Somsri Nganvongchon)
- Phenotypic relationship between age and weight at maturity of *Tilapia nilotica* (Ms. Supattra Uraiwan)
- Biology of fishes and fisheries aspects in Sirikit Reservoir (Ms. Boonyarat Chansawong-Team Leader)
- Pen culture development in reservoir (Sompong Hiranwat-Team Leader)
- Fish landing statistics survey in Srinakarind reservoir, Karnchanaburi province (Yothin Leenanond-Team Leader)
- Fisheries aspects of the lower Maeklong River (Y. Leenanond-Team Leader)
- Ecological and fisheries surveys in Tapi River and its tributaries (Tawan Chookajon Team Leader)
- Fish population estimated in northern tanks (Ms. B. Chamsawang-Team Leader)
- Cryogenic preservation of fish spermatozoa (Ms. Tassanee Prooripat-Team Leader)
- The effect of pesticides on fish in Suphanburee farm ponds (Maitree Duangsawasdi-Team Leader)
- Acute toxicities of pesticides on freshwater fishes (Maitree Duangsawasdi-Team Leader)
- Toxicities and impacts of toxicants from agriculture industries and households wastes on aquatic organisms (Maitree Duangsawasdi-Team Leader)
- Acute toxicity of Dieldrin and Heptachlor to pla Ta-Pian Khao, *Puntius gonionotus* (Bleeker) (Charuvan Somsiri-Team Leader)
- Acute toxicity of pesticide Gramoxone on Pla duk dan (*Clarias batrachus*) (Ms. C. Somsiri-Team Leader)
- Pond Dynamic (Vijai Srisuwantach-Team Leader)

Future programmes

- Response to selection and realized heritability for growth from three strains of *Tilapia nilotica* (*Seratherodon nilotica*)
- Cross breeding of common carp and mirror carp
- Development of micro-algae (*Spirulina*) production in North-Eastern Provinces (Ms. J. Boonsom-Team Leader)
- Fish culture development in reservoir (Sompong Hiranwat-Team Leader)
- Systematic study on the freshwater fishes from the southern part of Thailand (Jaranthada Karnasuta-Team Leader)
- Development and culture of *Daphnia japonica* for fingerling fishes (Jaranthada Karnasuta and Ms. Songpan Soonthornsatit)

Cooperative programme

- Programme for the development of Pond Management Techniques and Disease Control (a joint project by Department of Fisheries and UNDP/FAO)
- Network of Aquaculture Centers in Asia-UNDP/FAO Regional Project
- Development of micro-algae (Spirulina) production (Department of Fisheries-TCP/FAO)
- Handling of live Aquaculture Project - ASEAN-AUSTRALIA Project
- Collaborative Research Support Program between University of Michigan and NIFI (Funded by USAID)
- Fish Genetics (Department of Fisheries/IDRC)

Objectives and programmes **(Cont.)**

Training programme
- Special lectures and practical instructions for both undergraduate and graduate students on different disciplines of fisheries sciences
- Freshwater fish culture training programme (for Thai fisheries officers and fish farmers)
- Special lecture and training for international students under NACA programme and under Thai Aid Scholarships and as requested.

Institution structure

The Institute is organized in 6 sections:
- Fishery Resources Development
- Aquatic Environment
- Training and Information Service
- Aquaculture
- Fish Nutrition and Pathology
- Administration

Staff

39 Professional staff 31 Technical staff 116 Other staff

Professional scientific staff:

Name	Degree	Speciality
Thiraphan Bhukaswan	Ph.D.	Fisheries Management-Director
Sompong Hiranwat	M.Sc.	Fisheries management
Tawan Chookajorn	M.Sc.	Fisheries management
Yothin Leenanon	B.Sc.	Fish population
Boonyarat Chansawang (Ms)	B.Sc.	Fish population
Sumrauy Setkit (Ms)	M.Sc.	Fish population
Santana Duangsawasdi (Ms)	M.Sc.	Fish biology
Tassanee Pooripat (Ms)	B.Sc.	Fish biology
Kiet Leeprasert (Ms)	B.Sc.	Fish biology
Suweena Banyen (Ms)	B.Sc.	Fish biology
Jiamjit Boonsom (Ms)	M.Sc.	Ecology
Charuwan Somsiri (Ms)	M.Sc.	Fish toxicity
Jaranthada Kanasuta	Ph.D.	Fish taxonomy
Songpun Sunthornsatit (Ms)	M.Sc.	Fish taxonomy
Rachadaporn Kittivorachate	M.Sc.	Ecology
Sumalee Dulya-anakit (Ms)	B.Sc.	Ecology
Prasert Sitasitk	M.Sc.	Fish nutrition
Vijai Srisuwanatach	M.Sc.	Limnology
Wanpen Meenkarn (Ms)	B.Sc.	Fish culture (Aquarium)
Pakorn Oonprasert	M.Sc.	Fish culture
Tanaporn Chittapalapong (Ms)	M.Sc.	Microbiology
Manob Tangtrongpairos	M.Sc.	Aquaculture
Supatra Uraiwan (Ms)	M.Sc.	Fish genetics
Somsri Ngarmwongchon (Ms)	M.Sc.	Fish culture
Punsri Chirdchupunsri (Ms)	M.Sc.	Fish culture
Kamonporn Pawaputanon (Ms)	Ph.D.	Fish parasite
Sopa Areerat (Ms)	M.Sc.	Fish parasite
Sitdhi Boonyaratapalin	Ph.D.	Disease
Supranee Chinabut (Ms)	M.Sc.	Pathology
Hawareeya Ruengprach (Ms)	M.Sc.	Fish disease
Mali Boonyaratapalin (Ms)	Ph.D.	Fish nutrition
Nantiya Oonprasert (Ms)	M.Sc.	Fish nutrition
Maitree Duangsawasdi	Ph.D.	Fish toxicology
Suchin Nukwan	B.Sc.	Aquaculture
Viratada Sitasit (Ms)	B.Sc.	Fish nutrition

Premises/facilities

Building area: 5000 m² Laboratory area: 1200 m²
With facilities for:
Visiting Scientists: 1

Information facilities

Library holdings:
Number of books, journals, manuscripts, etc.: 7000
Number of periodical subscriptions:40

Monographs and serials titles:
- Annual report 1980 (Thai)
- Annual report 1981 (Thai)
- Technical paper (Thai, English abstract, irregular, latest issue No. 1-22, 1983)
- Handbook of diseases of culture *Clarias* (Pla duk) in Thailand 1981.

Equipment

Photofluorometer, Rockey washer hydro power cleaner, centrifuge and accessories, spectrophotometer double-beam, atomic absorption spectrophotometer, pH meter (automatic titrator), analytical balance, top-loading balance (electrical), water chemistry analysis

Equipment (Cont.)
kit (Hach), low temperature incubator, precision incubator, refrigerator, freezer, Gallenkamp incubator, Gallenkamp oven, Barnstead distiller, Labconco chamber, microtome knife sharpener, automatic autoclave (Sterilmatic), food mixer, microscope, gas-chromatograph.

Aquarium facilities
Total area: 1300 m² Number of tanks: 70

Species maintained for experimental purposes:

Spirulina sp.
Dactylogyrus sp.
Argulus sp.
Pristolepis fasciatus
Tilapia nilotica
Puntius gonionotus
Labeo bicolor
Mystus cavasius
Hampala macrolepidota
Wallagonia attu
Toxotes jaculatrix
Puntius altus
Catlocarpio siamensis
Helostoma temmincki
Osteochilus vittatus
Brachygobius xanthozona
Trichogaster trichopterus
Labeo bicolor
Rasbora palustris
Pangasius macronema
Crossocheilus reticulatus
Channa micropeltes
Mystus wyckii
Acipenser ruthenus
Epalzeorhynchos siamensis
Pangasianodon gigas
Datnioides guadrifasc.
Osteochilus hasselti
Glossogobius giuris
Macrognathus aculeatus
Trichopsis vittatus
Scatophagus argus
Kryptopterus cryptopterus
Botia lucus-bahi
Butis butis
Clarias nieuhofii
Rasbora dusonensis
Tetraodon palembangensis
Labiobarbus lineatus
Camallanus sp.
Senga sp.
Macrobrachium rosenbergi
Mystus nemurus
Cyprinus carpio
Hampala dispar
Trichogaster pectolaris
Clarias batrachus
Boesemania microlepis
Notopterus notopterus
Mystus vittatus
Morulius chrysophekadion
Cirrhinus microlepis
Scleropages formosus
Dermogenys pusillus
Scatophagus argus rubrif.
Esomus metallicus
Botia modesta
Cyclocheilichthys enoplos
Clarius batrachus
Rasbora heteromorpha
Tetraodon leiurus
Tor soro
Puntius orphoides
Puntius schwanenfeldii
Peralaubuca riveroi
Mastocembelus erythrot.
Botia lecontei
Acanthopsis choirorhynch.
Trichogaster microlepis
Luciosoma setigerum
Botia hymenophysa
Kryptopterus bicirrhis
Monodactylus argenteus
Channa lucius
Rasbora borapetensis
Botia sidthimunki
Bagarius bagarius
Ergasilus sp.
Helostomatis sp.
Pangasius sutchi
Oxyeleotris marmoratus
Labeo rohita
Kryptopterus bleekeri
Channa striatus
Labiobarbus hasseltii
Labeo frenatus
Puntioplites proctozyron
Pangasius sanitwongsei
Osteochilus melanopleura
Osphronemus goramy
Probarbus jullieni
Acanthophthalmus kuhlii
Betta splendens
Microphis boaja
Botia eos
Chanda siamensis
Garra taeniata
Channa marulius
Rasbora trilimeata
Tetradon somphongsi
Vaimosa siamensis
Datniodes microlepis
Aanbas testudineus
Leptobarbus hoevenii
Cirrhinus jullieni
Gyrinocheulus aymonieri
Panchax panchax
Trichogaster leeri
Homaloptera orthogoniata
Xenenthodon cancila
Cyclocheilichthys apogon
Clarias macrocephalus
Puntius partipentazona
Mystus nemurus
Balantiochilus melanopt.

Institution code: 000035 Information received: 26/10/83

สำนักงานคณะกรรมการสิ่งแวดล้อมแห่งชาติ วส.

Office of the National Environment Board (ONEB)

Executive officer SNIDVONGS Kasem: Secretary General

Postal Address

Office of the National Environment Board (ONEB)
60/1 Soi Prachasumpun 4, Rama VI Rd.
BANGKOK 10400

Telephone: 2797180-9
Cable: NEB, BANGKOK

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities

Ecological Sciences	Marine Fisheries
Resources Management	Aquaculture
Oceanography	Limnology
Chemical Sciences	Microbiology
Pollution	Policy and Planning

Areas of speciality

Demersal Fish	Pelagic Fish
Micro-organisms	Plankton
Benthos	Offshore Marine Waters
Coastal Marine Waters	Brackish Waters
Inland (Fresh) Waters	Mangroves Ecosystems
Coral Ecosystems	Metals
Halogenated Hydrocarbons	Pathogenic Micro-organisms
Nutrients	Radionuclides

Objectives and programmes

History of institution, its mandate and purpose

In recognizing the urgent need to launch an effective programme for the management of the country's general environmental problems and to respond to the organizational needs for protection of environmental quality, the Royal Thai Government promulgated in 1975 the Improvement and Conservation of National Environmental Quality Act. B.E. 2518. This act, among others, created the National Environment Board (NEB) and the Office of the National Environment Board (ONEB), an executive secretariat and the operational arm of the Board. The ONEB, formerly a sector of the Office of the Prime Minister, as of 23 March 1979 is an office in the newly established Ministry of Science, Technology and Energy. The main objective of the ONEB is to develop a means for the conservation and preservation of a high quality environment in harmony with economic development; as per article 77, 93 of the Constitution of the Thai Kingkom 'The State will be responsible for the balance of nature, scenic beauty, forest, water, etc., and to maintain the quality of life of the Thai People.'

Research, monitoring and other activities in the last three years

- Heavy metals, DDT, PCBs in the Upper Gulf of Thailand (Phase 1)
- Integrated planning for water quality management of Tha-chin River (Phase 1)
- Water quality management of Pattaya Beach, Chonburi province
- Water quality management of Huahin Beach, Prachubkeereekhun province
- Water quality management of Chao-Phraya River
- Solid waste problems and tourism development of Bangsaen Seaside Resort, Chonburi province
- Groundwater resources in Bangkok area: Development and management study (Phase 1,2)
- Protection and improvement of ground water crisis and land subsidence
- Investigation of land subsidence caused by deep well pumping in the Bangkok area
- A preliminary study on the use of fish from Chao Phraya River as bioassay organisms

Major current research and other activities

Heavy metals, DDT and PCB's in the Upper Gulf of Thailand (Phase 2)
Characterization of offshore tin-mining related sedimentation process and assessment of their impacts on the coastal environment and its living resources along the Andaman Sea Coast of Thailand

- Oceanographic investigations
- Turbidity/sediment studies
- Ecological impacts
- Abandoned onshore tin-mine plant cover studies
- Onshore tin-mine sedimentation studies

Objectives and programmes **(Cont.)**

- Remote sensing interpretation

Status evaluation of the Songkhla Lake Environment and Identification/Preliminary Assessment of Major Emerging Environmental Conservation Problems.

- Water quality/primary production/effect of salinity in outer lake
- Bacteriology of the outer lake
- Benthos distribution
- Survey of fishery resources using encircling net and set bag
- Survey of benthic fauna
- Survey of plankton standing crop
- Survey of water quality
- Water quality of inner lake
- Bacteriology of inner lake
- Pollution loading of selected tributaries
- Sediment chemistry
- Phytoplankton distribution in the inner lake
- Zooplankton distribution in the inner lake
- Benthos distribution
- Environmental effects of gillnet fishery
- Fishery resources using set-bag
- Fishery effects of remote irrigation water pumping
- Primary production and fishery productivity
- Survey of gillnet fishery
- Ecological studies of shorebirds
- Water quality monitoring programme
- Socio-economics of lake-shore populations
- Plankton studies

Integrated planning for water quality management of Tha-Chin River

Groundwater resources in Bangkok Ares: Development and management study (Phase 3)

Investigation of land subsidence caused by deep well pumping in the Bangkok area (Phase 3)

Water quality development of Chao-Phraya River

Water quality development of Bangpakong River

Water quality management of Songkhla Lake

Future programmes

Same as in the last three years

- Water quality development of Maklong River
- Artificial recharge of water into Bangkok multiaquifer system
- Songkhla lake basin planning study
- Eastern seaboard environmental resources inventory and impact assessment, management and monitoring project

Cooperative programme

- Integrated planning for water quality management of Tha-Chin River (cooperation with Thailand Institute of Scientific and Technology Research)
- The world-wide network of the international referral system for sources of environmental information (INFOTERRA), UNEP's programme for the critical assessment of the global environment, operates as the information exchange component of earthwatch to respond to the information needs of users in all countries (NEB, thus acts as INFOTERRA national focal point in Thailand; cooperation with INFOTERRA headquarters in Nairobi, Kenya)
- Characterization of offshore tin-mining related sedimentation process and assessment of their impacts on the coastal environment and its living resources along Andaman Sea coast of Thailand (cooperation with: Hydrology Department of the Royal Thai Navy; Phuket Marine Biological Center of the Department of Fisheries; Department of Mineral Resources and Land Development Department)
- Status evaluation of the Songkhla Lake environment and identification/preliminary assessment of major emerging environmental conservation problems. (cooperation with: Prince of Songkhla University; Songkhla Fisheries Department; Royal Irrigation Department; Thailand University Research Association)
- Protection and improvement on ground water crisis and land subsidence (cooperation with: Asian Institute of Technology; Department of Mineral Resources; Royal Thai Survey Department)
- Heavy metals, DDT and PCB's in the Upper Gulf of Thailand (cooperation with the Asian Institute of Technology (AIT))
- Project on oceanography (cooperation with: Hydrographic Department of the Royal Thai Navy; Department of Marine Science, Faculty of Science, Chulalongkorn University; Asian Institute of Technology (AIT); Department of Fisheries; Harbour Department; Meteorological Department; Port Authority of Thailand)
- Songkhla Lake Basin Planning Study (cooperation with: National Economic and Social Development Board (NESDB);

Training programme

- ONEB organizes a training programme on environmental education for secondary school teachers in Bangkok once a year. The main objective of the training is to develop the knowledge on environmental education for the teachers to teach their students more effectively, as well as, to be able to initiate and solve the environmental problems in their schools and communities.

Objectives and programmes (Cont.)
- **Training programme for the improving of personel efficiency from** governmental and private sector in the preparation of environmental impact assessment report

Institution structure
The Office is divided in:
- Office of the Secretary
- Information and Environmental Quality Promotion Division
- Environmental Policy and Planning Division
- Environmental Impact Evaluation Division
- Environmental Quality Standard Division

Staff
22 Professional staff 116 Technical staff 73 Other staff

Professional scientific staff:

Name	Degree	Speciality
Boriboon, S.	M.Sc.	Environmental health service
Vannasang, S.	M.Sc.	Water pollution
Fungladda, N.	Ph.D.	Botany, Ecology
Wanichsombut, C.	M.Sc.	Soil science
Poopetch, T.	Ph.D.	Marine pollution, Ecology
Wongchumpit, O.	M.Sc.	Tech. environmental management
Taranatham, P.	M.Eng.	Sanitary engineering
Kositratana, N.	M.Sc.	Environmental management
Puncharoen, P.	M.Sc.	Environmental biology
Nitaya, A.	M.Sc.	Sanitary engineering
Pienchob, T.	M.Sc.	Sanitary engineering
Sukasem, W.	B.Sc.	Marine science
Puncharoen, S.	B.Sc.	Biology
Apikamolkul, K.	B.Sc.	Chemistry
Kankuer, S.	B.Sc.	Chemistry
Padungchewit, Y.	B.Sc.	Chemistry
Tabucanon, M.	M.Sc.	Environmental management
Uawanichkul, S.	B.Sc.	Chemistry
Intarapanich, O.	B.Sc.	Chemistry
Suthicheanak, G.	B.Sc.	Chemistry
Sirivong, C.	B.Sc.	Biology
Nakranard, N.	B.Sc.	Chemistry

Premises/facilities
Laboratory area: 300 m²

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 1534
Number of periodical subscriptions:100

Monographs and serials titles:
- Environment (Journal, in Thai and English, 3 issues per year, available on exchange basis)
- National Environment Board (NEB) Newsletter (English, 4 issues per year, available on exchange basis)

Equipment
Automatic gas chromatograph, atomic absorption spectrophotometer, mercury analyzer, spectrophotometer, analytical balance, microscope, flowmeter, dissolved oxygen meter, automatic individual sampler, autoclave, oil monitor, current meter, water sampler, conductivity meter, nanometer, BOD apparatus, loading balance, pH meter, winch, improved Peterson dredge, automatic dispenser, total dispenser, total organic carbon apparatus, centrifuge, colony counter, plankton net.

Institution code: 000036 Information received: 14/07/83

กรมวิทยาศาสตร์บริการ วศ.

Department of Science Service (DSS)

Executive officer SURASITI Charlio: Director General

Postal Address

Department of Science Service (DSS)
Rama VI Street
BANGKOK 10400

Telephone: 282-2901

Working languages
Thai. English

Nature of institute
Governmental

Main fields of activities
Food Sciences / Food Technology
Pollution
Education, Training or Extension
Chemical Sciences
Engineering

Areas of speciality
Metals

Objectives and programmes
History of institution, its mandate and purpose
The Department was founded in 1891. The objectives of the Department in the field of environment is to monitor industrial pollution related to water, air and noise. The main purpose is to study and analyse pollutants in order to devise methods of waste treatment and control of pollution.
Research, monitoring and other activities in the last three years
Being mainly a service-oriented organization, the Department does not undertake any independent research programme. Joint research programmes are coastal pollution survey and joint project - Marine Pollution Committee of the National Research Council.
Major current research and other activities
The Department has a regular monitoring programme with the Ministry of Industry for heavy metals and air pollutants with a view to control the act on the conservation of national environment quality
Future programmes
Same as in the last three years
Continuation of current programme
Cooperative programme
- National Research Council of Thailand
Training programme
- The Department provides certificate courses in analytical chemistry

Institution structure
The Department is composed of:
- Office of the Secretary
- Research Division
- Analytical Chemistry Training Division
- Chemistry Division
- Physics and Engineering Division
- Biological Science Division
- Scientific and Technological Information Division

Staff
212 Professional staff 43 Technical staff 100 Other staff

Professional scientific staff:

Name	Degree	Speciality
Panpaprai, P.	M.Sc.	Food science
Lauvalert, Ch.	M.Sc.	Organic chemistry
Kerdkumrai, T.	M.Sc.	General science
Panyaporn, S.	B.Sc.	Chemical engineering
Yokubel, R.	B.Sc.	Chemical engineering
Chattay, P.	B.Sc.	General science
Mahachockleatwattana, P.	B.Sc.	Chemistry
Siritiptarvorn, N.	B.Sc.	Chemistry
Patanangkura, N.N.	Chem. Train. Cert.	Chemistry
Milindalekha, S.	Chem. Train. Cert.	Chemistry

Premises/facilities
Building area: 18000 m² Laboratory area: 15000 m²
With facilities for:
Students: 94

Information facilities
Monographs and serials titles:
- Annual Report, 1980, 1981, 1982

Equipment
UV-VIS Spectrophotometer, mercury analyzer, oxygen meter, tintometer, nitrogen analyzer, analytical balance, centrifuges, atomic absorption spectrophotometer, HPLC, GLC.

Institution code: 000037 Information received: 15/06/83

สถานวิจัยประมงทะเล สจ.

Marine Fisheries Laboratory (MFL)

Executive officer BOONPRAKORB Urupan: Director

Postal Address

Marine Fisheries Laboratory (MFL)
Stanwichaipramongtalé, 89/1 Soi Sapan-Pla, Yannawa
BANGKOK 10120

Telephone: 2114981-2

Working languages
Thai, English

Nature of institute
Governmental

Main fields of activities
Marine Fisheries
Oceanography
Pollution
Aquaculture
Chemical Sciences

Areas of speciality
Demersal Fish
Other Invertebrates
Plankton
Coastal Marine Waters
Mangroves Ecosystems
Metals
Pelagic Fish
Algae
Benthos
Brackish Waters
Coral Ecosystems
Nutrients

Objectives and programmes
History of institution, its mandate and purpose
Established by the Government of Thailand under Thai-German bilateral agreement and officially opened on June 24, 1965. Under the Marine Fisheries Division of the Department of Fisheries, the laboratory has conducted research for marine fisheries development. In October, 1975 it has been fully transferred to the Department of Fisheries, and due to the restructuring of the Marine Fisheries Division in 1976, the present responsibility of Marine Fisheries Laboratory are to give emphasis on fishery oceanography and marine pollution. The objectives of the Laboratory are to provide information on physico-chemical and biotic properties of the seas around Thailand required for fisheries research.

Research, monitoring and other activities in the last three years
- Pollution Control: Investigations of sources and inputs of marine pollutants (sponsor: National Research Council of Thailand)
- Algal culture: A culture collection of algae to provide cultures to all interested individuals and organizations
- Marine Environmental Monitoring and Living Resources Assessment: Monitoring of physico-chemical and biotic properties of the Gulf of Thailand to provide information to fisheries research

Major current research and other activities
- Taxonomic studies on marine fish and invertebrates in Thai and adjacent waters (Ms. P. Sukhavisidh)
- Qualitative and quantitative studies of plankton in the Gulf of Thailand (Ms. S. Suvapepun)
- Plankton culture (Ms. P. Sribyatta)
- Chemical studies in the coastal and offshore waters of the Gulf of Thailand (Ms. C. Tharnbupha)
- Marine pollution monitoring (Ms. C. Tharnbupha)
- Studies on primary productivity of the Gulf of Thailand (Ms. L. Lursinsub)
- Qualitative and quantitative assessment of benthic biomass (M. Charearnroy)
- Organic matter in the sediments of the Gulf of Thailand (M. Charearnroy)
- Acquisition, processing, evaluation and management of oceanographic data and information of the Gulf of Thailand (V. Hongskul)

Future programmes
Continuation of current programme

Cooperative programme
- Department of Marine Science, Chulalongkorn University (Marine plankton)
- National Research Council of Thailand (Pollution)
- SEAFDEC (Fisheries environmental study)

Institution structure
The Marine Fisheries Laboratory is divided into six units:
- Reference collections
- Plankton analysis
- Water chemistry

Institution structure (Cont.)
- **Assessment of primary productivity**
- **Assessment of benthic biomass**
- **Data processing**

Staff
19 Professional staff 16 Technical staff 11 Other staff

Professional scientific staff:

Name	Degree	Speciality
Suvapepun, C. (Ms)	B.Sc.	Plankton
Tharnbupha, C. (Ms)	B.Sc.	Chemical oceanography
Lursinsab, A. (Ms)	M.Sc.	Primary productivity
Charearnroy, M.	B.Sc.	Benthic biomass
Sukhavisith, P. (Ms)	B.Sc.	Reference collection
Sribyatta, P. (Ms)	M.Sc.	Plankton culture
Suwanrumpha, W. (Ms)	M.Sc.	Zooplankton
Lulitamonda, N. (Ms)	B.Sc.	Pollution
Phiromnim, M. (Ms)	M.Sc.	Phytoplankton
Piamthipmanus, N. (Ms)	B.Sc.	Benthic animals
Chernbumrung, S. (Ms)	B.Sc.	Pollution
Srimanophas, V.	B.Sc.	Algae

Premises/facilities
Laboratory area: 600 m²
With facilities for:
Visiting Scientists: 1 Students: 5

Information facilities
Library holdings:
Number of periodical subscriptions: 71

Monographs and serials titles:
- Contributions of the Marine Fisheries Laboratory (in Thai and English)
- Annual Report 1981-1983 (in Thai and English)

Equipment
Spectrophotometer (UV-VIS), AAS with Hg analyser, salinometer, water sampler, corer, grab, dredge, current meter, low temperature incubator, fluorimeter and colorimeter.

Aquarium facilities
Total area: 56 m² Number of tanks: 12

Organisms maintained:
Crustaceans Other Invertebrates Algae
Micro-organisms

Species maintained for experimental purposes:

Skeletonema costatum	*Chaetoceros calcitrans*	*Chlorella spp.*
Isochrysis sp.	*Chlamydomonas spp.*	*Tetraselmis sp.*
Thalassiosira sp.	*Dunaliella sp.*	*Platymonas sp.*
Diaphanosoma sp.	*Brachionus plicatilis*	*Schizopera subterranea*
Microcyclops sp.	*Penaeus spp.*	*Lates calcarifer*

Institution code: 000038 Information received: 05/07/83

ศูนย์ชีววิทยาทางทะเล ภูเก็ต

Phuket Marine Biological Center (PMBC)

Executive officer BOONLERT Phasuk: Director

Postal Address

Phuket Marine Biological Center (PMBC)
51, Sukdidet street
P.O. Box 60
PHUKET 83000

Telephone: 212357-8

Working languages
Thai, English

Nature of institute
Governmental Academic

Main fields of activities

Biological Sciences	Ecological Sciences
Marine Fisheries	Aquaculture
Oceanography	Pollution
Education, Training or Extension	

Areas of speciality

Marine Mammals	Other Vertebrates
Lobsters	Other Invertebrates
Plankton	Benthos
Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Mangroves Ecosystems
Coral Ecosystems	Petroleum Hydrocarbons
Metals	Nutrients
Radionuclides	

Objectives and programmes

History of institution, its mandate and purpose
The Center was established on October 16, 1968 as the result of the Agreement between the Thai and the Danish Governments to carry out research, and to train and educate both Thai and foreign students in the field of marine sciences.

Research, monitoring and other activities in the last three years
Research on taxonomy (fish, molluscs, spiny lobsters and corals) marine pollution (heavy metals, hydrocarbons), marine environment (physical and chemical oceanography), coral reefs, mangrove ecology and primary productivity.

Major current research and other activities
Same as in the last three years
Distribution and species composition of plankton along the western coast of Thailand. Public Aquarium open daily.

Future programmes
Same as in the last three years
Continuation of current programme

Cooperative programme
- Thai National Research Council (Distribution of tarballs along the west coast of Thailand)
- Department of Mineral Resources (Effects of tin dredging upon marine organisms)
- National Environmental Board (Coral reef and water quality assessment)

Training programme
- Under-graduate level courses in marine ecology for national university students.

Institution structure

The Center is divided into 7 units:
- Administration
- Taxonomy
- Marine Pollution
- Marine Environment
- Coastal Ecology
- Off-shore Ecology
- Public Aquarium

Staff

17 Professional staff 20 Technical staff 4 Other staff

Professional scientific staff:

Name	Degree	Speciality
Boonlert Phasuk	M.Sc.	Fishery biology
Pensri Boonruant (Ms)	M.Sc.	Plankton ecology
Prawin Limpsaichol	M.Sc.	Marine pollution
Oonchit Bhatia (Ms)	M.Sc.	Marine biology (Aquarium)
Hansa Chansang (Ms)	Ph.D.	Coastal ecology

Staff (Cont.)

Name	Degree	Speciality
Saran Petpiroon	Ph.D.	Oil pollution
Anuwat Nateewathana	B.Sc.	Taxonomy
Supot Chantrapornsyl	B.Sc.	Aquarium
Vudhichai Janekarn	B.Sc.	Primary productivity
Potchana Boonyanate	B.Sc.	Aquarium
Sombat Poovachiranon	B.Sc.	Mangrove eco-system
Somchai Bussarawich	B.Sc.	Taxonomy
Mickmin Charuchinda	B.Sc.	Coral reef
Bamroongsak Chatananthawej	B.Sc.	Benthos
Somkiat Khokiattiwong	B.Sc.	Marine environment

Premises/facilities
Building area: 1638 m² Laboratory area: 700 m²
With facilities for:
Visiting Scientists: 5 Students: 30

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 7385
Number of periodical subscriptions: 121

Monographs and serials titles:
- The institution's monograph: Phuket Marine Biological Center. Research Bulletin No. 28, 1981
- The current serials: Phuket Marine Biological Center. Research Bulletin No. 28, 1981. Special publication on the occasion of the tenth anniversary.

Equipment
35 microscopes (different types), C-15 counter, conductivity meter, 2 pH-meters, current meter, oxygen meter, spectrophotometer, underwater lightmeter, furnace, oven autoclave, 2 balances, environmental chamber, sediment grabs, plankton nets, 6 water-bottle samplers, 5 complete diving equipments with compressor, photographic equipment, myotome.

Aquarium facilities
Total area: 80 m² Number of tanks: 40

Organisms maintained:
Other Vertebrates Crustaceans Other Invertebrates
Algae

Species maintained for experimental purposes:

Chelonia mydas *Lepidochelys olivacea* *Eretmochelys imbricata*
Panulirus ornatus *Panulirus versicolor* *Panulirus homarus*
Goniopora stokesi *Euphyllia fimbriata* *Euphyllia glabrescens*
Catalaphyllia plicata *Ammphiprion percular*

Research craft
Name: PRAMONG 8
Owner: Dept. of Fisheries, Min. Agr. Coop.
Length: 17 m.
Type: Vessel
Date of construction: 1971
Crew: 8
Scientists: 5
Lab. space: 6 m2
Special facilities:
Echosounder, radar, VHF radio equipment, and oceanographic instruments.

Institution code: 000039 Information received: 17/06/83

สถาบันเทคโนโลยีแห่งเอเชีย

Asian Institute of Technology
Environmental Engineering Division, (AIT)

Executive officer NORTH, Alastair M.: President

Postal Address

Asian Institute of Technology
Environmental Engineering Division, (AIT)
P.O. Box 2754
BANGKOK 10501

Telephone: 523-9300-13/523-8891-3
Telex: 84276 TH
Cable: AIT BANGKOK

Working languages
English

Nature of institute
Academic Private (non-profit)

Main fields of activities

Biological Sciences	Ecological Sciences
Food Sciences / Food Technology	Aquaculture
Microbiology	Pollution
Engineering	Geology (incl. Sedimentology)
Policy and Planning	Mutual Assistance / Technology Transfer
Marketing / Economics	Social Sciences
Computer / Information Systems	Education, Training or Extension

Areas of speciality

Algae	Micro-organisms
Thermal	Tide / Waves
Wind	Offshore Marine Waters
Coastal Marine Waters	Brackish Waters
Inland (Fresh) Waters	Mangroves Ecosystems
Coral Ecosystems	Petroleum Hydrocarbons
Metals	Halogenated Hydrocarbons
Pathogenic Micro-organisms	Nutrients
Radionuclides	

Objectives and programmes

History of institution, its mandate and purpose

The Asian Institute of Technology (AIT), established in 1959, is an autonomous, non-profit, international and coeducational post-graduate technological institution, providing education in engineering, science and allied fields.

Research, monitoring and other activities in the last three years

Major current research and other activities

Its Environmental Engineering Division (see Institution Structure), concentrates on two fields of study namely water and wastewater engineering and environmental technology and management. In the field of water and wastewater engineering provides assistance to engineers wishing to design, construct and operate engineering works for water supply and wastewater treatment and disposal. The field of study on environmental technology and management relates to air, water, noise and solid waste pollution.

Training programme

Presently, AIT offers Doctoral, Master and Diploma programs in nine academic divisions. Furthermore, a Continuing Education Center has been established to provide short training programs in various fields (e.g. environmental quality amanagement, chemistry, health, water engineering desing, computer technology etc.)

Institution structure

The AIT consists of nine academic divisions:
- Agricultural and Food Engineering
- Computer Applications
- Energy Technology
- Environmental Engineering
- Geotechnical and Transportation Engineering
- Human Settlements Development
- Industrial Engineering and Management
- Structural Engineering and Construction
- Water Resources Engineering

Staff

11 Professional staff 0 Technical staff 0 Other staff

Staff (Cont.)
Professional scientific staff:

Name	Degree	Speciality
Fude, I.	PH.D.	Environmental management
Thanh, N.C.	D.Sc.	Environmental technology Environmental management Resources conservation
Lohani, B.N.	D.Eng.	Environmental technology Environmental management Environmental engineering
Muttamara Samorn	M.Sc.	Environmental technology Environmental management
Hermann Orth	Dr.Ing.	Environmental engineering
Polprasert, Chongrak	Ph.D.	Environmental engineering
Shinichiro Ohgaki	D.Eng.	Environmental engineering
S. Vigneswaran	D.Eng.	Environmental engineering
Kiravanich, Pakit	Ph.D.	Environmental engineering Environmental management
Phothiphichitr Wanchai	Ph.D.	Noise control
Benjasil Suwat	B.Sc.	Environmental technology Environmental management
Boonthanon, Sompol	M.Sc.	Environmental technology Environmental management
Nandy, Bikash	M.Eng.	Water engineering Wastewater engineering

Premises/facilities
Building area: 1200 m² Laboratory area: 950 m²
With facilities for:
Students: 85

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 120000
Number of periodical subscriptions:1000

Monographs and serials titles:
- AIT Review (quarterly)
- The Prospectus (yearly)
- The Research Summary (yearly) - AIT last edition August 1980-April 1982; Division of Environmental Engineering last edition April 1982 - April 1983.

Equipment
Analytical balances, spectrophotometer, atomic absorption spectrophotometer, bomb calorimeter, centrifuge, fermenter (automatic), filterability tester, flame photometer, total organic carbon analyzer, Co-IR analyzer, NOx analyzer, gas chromatograph, photomicrograph set, polarimeter.

Aquarium facilities
Number of tanks: 65

Organisms maintained:
Algae Micro-organisms

Institution code: 000040 Information received: 03/11/83

คณะประมง มหาวิทยาลัยเกษตรศาสตร์

Faculty of Fisheries, Kasetsart University

Executive officer TARNCHALANUKIT Wit: Dean

Postal Address

Faculty of Fisheries, Kasetsart University
50, Phaholyothin Road
BANGKHEN 10900, BANGKOK

Telephone: 5791202

Working languages
Thai, English

Nature of institute
Governmental Academic

Main fields of activities
Biological Sciences
Ecological Sciences
Marine Fisheries
Inland Fisheries
Fishing Technology
Food Sciences / Food Technology
Aquaculture
Pollution

Areas of speciality
Offshore Marine Waters
Coastal Marine Waters
Brackish Waters
Inland (Fresh) Waters
Metals

Objectives and programmes
History of institution, its mandate and purpose
The Faculty of Fisheries was founded in 1943 as a faculty of the Kasetsart University. The Faculty performs research in the field of culturing marine and freshwater species, general marine and fishery biology, fishery economics, processing and conservation of fish, oceanography and marine pollution. The main purpose of the Faculty is to provide a broad education and professional training in fishery science with specialization in fishery biology, aquaculture, fishery management, marine science, and fishery products in order to serve the need of the Department of Fisheries in the Ministry of Agriculture. In addition to these tasks the Faculty recruits the competent fishery biologists for the Department of Fisheries. The Faculty also provides biologists, teachers, and science administrators for other governmental agencies such as the Ministry of Education, the National Research Council and private firms.

Research, monitoring and other activities in the last three years
- Socio-economic status, living conditions and income conditions of the marine fishing households in Ban Phe, Thailand. (1981)
- Fishery resources in the Lang Suan River Basin, Chumphon Province. (1981)
- Fishery resources in the Pak Mun River, Ubol Ratchatani Province. (1981)
- Fishery resources and fisheries activities in the Nam Pong Reservoir. (1981)
- Nutrition and income subsidies from the culture of some fishes species on the highlands of Northern Thailand. (1981)
- A study on morphological changes of fish larvae in brackish water. (1982)
- Studies on bacteria isolated from solar salt selling at Bangkok's market. (1982)
- Chemical composition of fish meal in Thailand. (1982)
- Protein requirements of *Clarias batrachus* (Linnaeus). (1982)
- The investigation of some bacteria isolated from Artemia's salt bed. (1982)
- Seasonal variation of parasites in alimentary canal of snake-head fish (*Ophicephalus striatus* Bloch) from natural waters. (1982)
- Acceleration of fish sauce fermentation. (1982)
- The economics of catch taken by otter board trawl fishing and marketing in Samut Sakhon fish market area. (1982)
- An experiment on artificial reef in coastal area of the Si Racha Fisheries Research Station. (1982-1983)
- An experiment on coconut leaves for fish luring in Si Racha Bay. (1982-1983)
- Study on distribution and abundance of *Donax faba* Chemnitz in Si Racha Bay. (1982-1983)
- A study on Gracilaria culture in Si Racha Bay. (1982)
- Feeding on the grouper *Epinephelus sp.* in rearing ponds and nylon net cages. (1982)
- An investigation of marine fishes from the Andaman Sea Side of Thailand. (1982)
- Socio-economic status, living conditions and income conditions of marine fishing households in Paknam Pran Buri, Thailand. (1982)

Objectives and programmes **(Cont.)**

- **Genetic improvement of some economic fish species. (1983)**
- An investigation on species composition of fishes from small scale fisheries at Klong Wan, Prachuab Kirikhan Province. (1983)
- Accumulation of some heavy metals in *Donax faba* Chemnitz, *Crassostrea spp.* and *Mytilus edulis* in Si Racha Bay. (1983)
- A study on the efficiency of the sizes of traps and the bait used. (1983)

Major current research and other activities

Department of Aquaculture:

- Genetic improvement of some economic fish species
- A study on Clarias diseases reared in recirculating water system

Department of Fishery Biology:

- Variation of hematocrit haemoglobin value and red cell ionic composition in catfish (*Clarias batrachus*) exposed to *Aeromonas hydrophila*
- Pathology and studies on chemicals for treatment of experimental infection of *Aeromonas hydrophila* in *Clarias batrachus* and *Ophicephalus striatus*
- Histopathological effects of Paraquat herbicide on snakeheads (*Channa striata*) in Thailand
- Environmental stress and *Aeromonas hydrophila* infection in snakehead fish (*Ophicephalus striatus*)
- Effects of Dieldrin and Furadan on snakehead fish (*Ophicephalus striatus*)
- pH: Cause of freshwater-fish kill in Thailand
- The use of some antibiotics and chemicals for diseases treatment in sand goby (*Oxyeleotris marmoratus*)
- Effects of some chemicals on therapeutic treatment and water quality
- Systematic and ecological studies of coral-reef fishes

Department of Fishery Management:

- Socio-economic survey on marine fishing households

Department of Fishery Products:

- The investigation of nitrate and non-nitrate reducing bacteria in Thai's salted fish
- Fish sauce from *Tilapia nilotica* Linnaeus

Department of Marine Science:

- A study on the efficiency of various colours of underwater lamps on the catch of aquatic animals
- Parasites of green mussel *Perna viridis* (Lin) and oyster (*Crassostrea commercialis* Iredale & Roughly) from the east coast of the upper Gulf of Thailand
- Parasites of some marine fishes from the Gulf of Thailand
- A study on phytoplankton occurred in red tide
- Effect of lysine on growth of giant tiger prawn

Future programmes

Emphasize inland and coastal aquaculture, and fish diseases, and amongst other the following projects:

- Breeding and rearing of tiger prawn (*Penaeus monodon* Fabricius) and white prawn (*P. merguiensis* de Man)
- Propagation of mud crab (*Scylla serrata*) and spiny lobsters (*Panulirus spp.*)
- Breeding and rearing of bivalve (*Crassostrea sp.*) at the hatchery
- Breeding and rearing of grouper (*Epinephelus tauvina* Forsskal) and level finned eel (*Anguilla sp.*)
- Development of diets for sand goby and giant sea bass
- Causes of broken back syndrome in walking catfish (*Clarias batrachus*
- Genetic improvement of Thai walking catfish *Clarias batrachus* (Linnaeus)
- Economics of fish seed production

Cooperative programme

Research on marine water quality and its living resources is conducted in cooperation with other government organizations.

Training programme

The Faculty offers courses leading to the degree of B.Sc. and M.Sc. in Fisheries. Furthermore courses have been arranged for students in aquaculture, fishery biology, fishery management, fishery products and marine science.

Institution structure

The Faculty, under supervision of the Rector of the University is divided into five departments:

- Aquaculture (with research centre)
- Fishery Biology
- Fishery Management
- Fishery Products and
- Marine Science (with two training stations)

Staff

Professional scientific staff:

Name	Degree	Speciality
Satuan Pinnoi	M.Sc.	Fishery economics
Kungwan Juntarashote	M.Sc.	Fishery economics, Fishery extension, Fishery statistics
Sukum Rowchai	M.Sc.	Resource management
Supote Tongnobhakun	M.Sc.	Fishery administration
Tasanee Sorasuchart (Ms)	M.Agr.	Food technology
Amnuay Chotiyarnwong	M.Sc.	Fishery product analysis
Mayuree Chaiwattana (Ms)	M.Sc.	Microbiology, Fish processing
Nongnuch Raksakulthai (Ms)	M.Sc.	Fish processing
Mathana Sangjindawong (Ms)	M.Sc.	Fishery microbiology
Bung-orn Chuapoehuk (Ms)	B.Sc.	Fish processing
Chaloemwilai Chuensri	M.Sc.	Reptantia, Marine ecology
Wantana Yoosukh (Ms)	M.Sc.	Marine molluscs, Fish parasites
Suebsin Sontirat	Ph.D.	Fish behaviour, Fish taxonomy
Mahn Bhovichitra	Ph.D.	Biological oceanography
Suchint Deetae	M.Sc.	Marine chemistry
Prachuab Lumubol (Ms)	M.Sc.	Biology (shrimps, prawns)
Chaichan Mahasavasde	M.Sc.	Fishing gears
Udom Sitiphuprasert	M.Sc.	Oceanography
Sutcha Yuenyong	B.Sc.	Primary productivity
Sunan Patarajinda (Ms)	M.Sc.	Marine phytoplankton
Wit Tarnchalanurit	B.Sc.	Fish breeding, Fish culture
Wiang Chuapoehuk	Ph.D.	Aquaculture
Prawit Suraniranat	B.Sc.	Aquaculture
Prathaks Tabthipwan	M.Sc.	Aquaculture
Yon Music	Ph.D.	Coastal aquaculture
Uthairat Na-Nakorn (Ms)	M.S.	Aquaculture
Khanjanapaj Lewmanomont (Ms)	M.S.	Phycology (taxonomy, culture)
Supap Monkolprasit (Ms)	M.S.	Ichthyology of fishes, Taxonomy of fishes
Prichar Sommani	Ph.D.	Fishery biology, Population dynamics
Suri Vimollohakarn (Ms)	B.Sc.	Fishery literature
Praphaisiri Sirikanchana (Ms)	M.S.	Fish parasites
Pramarn Phromsuthirak	Ph.D.	Limnology, Water pollution
Rassmee Sroivattana	M.Sc.	Aquatic ecology
Ladda Wongrat (Ms)	M.S.	Planktonology
Prajit Wongrat	Ph.D.	Biology, Taxonomy (fishes)
Taweesak Songsirikul	B.S.	Ichthyology, Taxonomy (fishes)
Songsri Mahasawasdi (Ms)	M.S.	Animal physiology
Sutham Sittichaikasem	Ph.D.	Fisheries biology, Aquatic toxicology
Teera Lekchonlaryut	M.S.	Aquatic ecology
Chalor Limsuwan	Ph.D.	Fish pathology

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 2500
Number of periodical subscriptions:30

Monographs and serials titles:
- Kasetsart University Fishery Research Bulletin (in English, occasionally, available on exchange basis)
- Notes from Faculty of Fisheries, Kasetsart University (in English occasionally, available on exchange basis)

Equipment
The Faculty of Fisheries has adequate equipment for academic and research purposes.

Institution code: 000041 Information received: 01/08/83

ภาควิชาวิทยาศาสตร์ทางทะเล คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

Department of Marine Science, Faculty of Science, Chulalongkorn University

Executive officer PIYAKARNCHANA Twesukdi: Head

Postal Address

Department of Marine Science, Faculty of Science, Chulalongkorn University
Phya Thai Road
BANGKOK 10500

Telephone: 2511951/2516968

Working languages
Thai, English

Nature of institute
Governmental Academic

Main fields of activities

Ecological Sciences	Marine Fisheries
Quality Control (fishery Products)	Aquaculture
Oceanography	Pollution
Geology (incl. Sedimentology)	

Areas of speciality

Demersal Fish	Pelagic Fish
Shrimps / Prawns	Other Invertebrates
Algae	Plankton
Benthos	Tide / Waves
Offshore Marine Waters	Coastal Marine Waters
Brackish Waters	Mangroves Ecosystems
Coral Ecosystems	Petroleum Hydrocarbons
Metals	Halogenated Hydrocarbons
Pathogenic Micro-organisms	Nutrients

Objectives and programmes

History of institution, its mandate and purpose

The Department of Marine Science was set up in 1968. The main objectives of the Department are the following:

- To produce qualified marine scientists to meet the nation's growing need at present and in the future
- To train marine scientists capable to carry on their study towards advanced degrees either in Thailand or abroad
- To establish teaching and research facilities aimed at the exploitation of natural resources from the sea
- To develop modern and effective methods in using the sea for exploration, exploitation, communication, shipping, defence, etc.

The following areas are the main reseach activities:
Taxonomy of marine organisms, experimental marine biology, coastal mariculture, behaviour of marine animals, marine chemistry, marine pollution and physical oceanography of the estuaries.

Research, monitoring and other activities in the last three years

- Marine pollution study in the Gulf of Thailand 1976-1978
- A study on nature, properties and impacts on the living organisms of the polluted water in the vicinity of the river mouth of Mae Klong River, Samutsongkram Province, Bangpakong River
- Distribution and some studies on the development of blue crab, *Portunus pelagicus* (L.) and their correlations with some environmental factors at Angsila, Cholburi Province
- Ecology of fish population in the coastal area of Bang Pra, Cholburi Province
- Mercury content of several predacious fish in the Andaman Sea
- Problems and suggested solution for freshwater prawn (*Macrobrachium*) management and farming
- The study on fouling organism and some other marine organisms which may affect the underwater construction at Ao Pai
- A study on the possible cause of mortality of blood clam (*Anadara granosa*) at the Mae Klong river mouth
- The concentration of lead in the hair of urban and rural inhabitants
- The effect of irrigation on the water quality of lower Pasak River
- Effects of temperature changes on some marine organisms of the Gulf of Thailand
- Distribution of some toxic wastes and polluting condition of the lower section of the Chao Phya River
- Studies on taxonomy and population of marine fish at Ang-Sila, Cholburi Province
- A geochemical study of the interstitial water and sediments in the upper Gulf of Thailand
- Some chemical aspects of the marine pollution study in the Gulf of Thailand

Objectives and programmes (Cont.)

- **The cause of the fluctuation of sea-level at sattahip**
- The analyses of the bottom sediments and some island rock outcrops in the southern part of the Andaman Sea
- Reproduction, nutrition and tolerance of the giant freshwater prawn (*Macrobrachium rosenbergii*) (Piamsak Menasveta)
- Ichthyoplankton in Ang Sila Area (Wimon Hemachandra) - completed April, 1983
- The estuarine ecosystem of the Phang Nga Bay (Absornsuda Siripong et. al.) - published some sections in 1981, 1982, and 1983
- Remote sensing application in oceanography (Absornsuda Siripong) published in 1982
- Relationship between coliform bacteria in sediments and in certain molluscs in the upper part of the Gulf of Thailand (Wimon Hemachandra and Suchana Wisessang) - completed 1982
- The optimum environmental factors for cultivation of oyster (*Crassotrea commercialis*) (Manuwadi Hungspreugs and staff) completed 1982
- Experimental cage culture of marine fish (Piamsak Menasveta) completed 1982
- Uptake of lead and mercury by green mussels (*Mytilus viridis L*) completed 1982.
- Artificial reef for fisheries (Suthichai Tamiyavanich and staff) completed 1982.
- Accumulation of certain heavy metals and DDT residues in marine benthic invertebrates (Manuwadi Hungspreugs) - completed 1982.
- Effect of hydrogen sulfide on marine benthic invertebrates (Nittharatana Paphavasit) - completed 1981.
- Comparative study on total sulfide capacity and total organic content in sediments in Gulf of Thailand and Andaman Sea (Nittharatana Paphavasit) - completed 1982.
- The chemical studies on the interstitial waters and sediments in the estuarine area of the Upper Gulf of Thailand. (Manuwadi Hungspreugs and staff) - completed 1982.
- Diffraction of water waves in water of variable depths (Jesada Jiraporn).

Major current research and other activities

- Integrated studies of changes of ecosystem in the suburban area north of Metropolitan Bangkok (T. Piyakarnchana et. al.).
- Seasonal variation of lead and mercury in mussels and plankton of the Chao Phaya river estuary (P. Menasveta).

Future programmes

- Marine pollution study in Thai water (staff).
- Survey of coral reefs in the Gulf of Thailand.
- Relationship between colifrom bacteria in sediments and in certain molluscs in the upper part of the Gulf of Thailand.
- Rearing methods and determination of optimum growth duration of *Macrobrachium rosenbergii*.
- Internal waves in the Andaman Sea.

Cooperative programme

The Department of Marine Science is under the last phase of the UNDP program in developing the graduate studies in the department (The UNESCO/UNDP Project "Improvement of Marine Science Education THA/78/021)

Training programme

- Undergraduate level: Three options provided are Marine Science, Marine Biology and Fisheries, Physical and Chemical Oceanography
- Master degree level: Two options provided are Marine Biology and Physical and Chemical Oceanography

Institution structure

- Main campus in Bangkok (chemical, biological, physical and geophysical oceanography laboratories)
- Marine laboratory (Ang Sila, Cholburi Province)
- Marine Science Centre (Si Chang Island)

Staff

16 Professional staff 2 Technical staff 3 Other staff

Professional scientific staff:

Name	Degree	Speciality
Mahunnop Bunpapong	M.Sc.	Coastal engineering
Sirichai Dharmavanij	M.Sc.	Physical oceanography, Chemical oceanography
Wimon Hemachandra	M.Sc.	Marine biology
Manuwadi Hungspreugs	Ph.D.	Chemical oceanography, Marine pollution
Jesada Jiraporn	M.Eng.	Ocean engineering
Piamsak Menasveta	Ph.D.	Water pollution, Aquaculture
Nittharatana Paphavasit	M.Sc.	Marine biology
Twesukdi Piyakarnchana	Ph.D.	Marine biology,

Staff (Cont.)

Name	Degree	Speciality
		Marine ecology, Marine Zoogeography
Absornsuda Siripong	M.Sc.	Physical oceanography, Geological oceanography
Suraphol Sudara	Ph.D.	Planktonology, Taxonomy, Environmental management
Suthichai Temiyavanich	M.Sc.	Marine biology
Gullaya Wattayakorn	M.Sc.	Environmental science
Suchana Wisessang	M.Sc.	Marine biology
Somkiate Piyatiratitivorakul	M.Sc.	Marine Biology
Anond Sanitwong Na Ayudhaya	B.Sc.	Marine Biology
Wilaiwan Thumtrakul	M.Sc.	Marine Chemistry

Premises/facilities
Building area: 2000 m² Laboratory area: 2000 m²
With facilities for:
Visiting Scientists: 10 Students: 68

Information facilities
Library holdings:
Number of books, journals, manuscripts, etc.: 952
Number of periodical subscriptions:64

Equipment
Gas chromatograph, spectrophotometer, BOD incubator, atomic absorption spectrophotometer, mercury analyzer, Gilson respirator, osmometer, dissecting microscope with camera lucida, Rotary evaporator, scintillation counter, spectroflourometer, salinometer, current meter, bottom sampler, STD recorder, echosounder and large volume water sampler.

Aquarium facilities
Number of tanks: 35

Research craft
Type: motorboat

Institution code: 000042 Information received: 15/06/83

UNEP REGIONAL SEAS DIRECTORIES AND BIBLIOGRAPHIES

UNEP, 1976 Directory of Mediterranean marine research centres. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 280 p., 1st ed. (out of print)

UNEP, 1977 Directory of Mediterranean marine research centres. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 622 p., 2nd ed. (out of print)

NIO/UNEP, 1978 Directory of Indian Ocean marine research centres. UNEP Regional Seas Directories and Bibliographies. Goa, NIO, 360 p. (out of print)

UNEP/IOC, 1980 Directory of Caribbean marine research centres. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 500 p. (out of print)

IAEA/UNEP, 1981 Directory of Kuwait Action Plan marine science centres. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 110 p. (out of print)

UNEP/CCPS, 1981 Directory of the South East Pacific marine science research centres. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 120 p. (out of print)

UNEP/FAO/Unesco/WHO/WMO/IOC/IAEA, 1981 Selected bibliography on the pollution of the Mediterranean Sea. UNEP Regional Seas Directories and Bibliographies. Geneva, UNEP, 130 p. (out of print)

UNEP/UN/ECA/Unesco, 1982 Directory of marine research centres in Africa. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 254 p.

UNEP, 1984 Bibliography of the marine environment in the Kuwait Action Plan region. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 52 p.

UNEP, 1984 Bibliography of the marine environment in South Asian Seas. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 39 p.

UNEP, 1984 Bibliography of the marine environment in East Asian Seas. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 76 p.

UNEP/Pacific Science Association/SPREP/University of Guam, 1984 Directory of Pacific coral reef researchers. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 101 p.

UNEP/FAO, 1984 Directory of marine environmental centres in East Asian Seas. UNEP Regional Seas Directories and Bibliographies. Rome, FAO, 138 p.

UNEP/FAO, Directory of marine environmental centres in Mediterranean. UNEP Regional Seas Directories and Bibliographies. 3rd ed. (in preparation)

UNEP/FAO, Bibliography of the marine environment in Mediterranean, 1978-1984. UNEP Regional Seas Directories and Bibliographies. (in preparation)

UNEP/FAO, Directory of marine environmental centres in Caribbean. UNEP Regional Seas Directories and Bibliographies. 2nd ed. (in preparation)

UNEP/FAO, Directory of marine environmental centres in South Pacific. UNEP Regional Seas Directories and Bibliographies (in preparation)

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