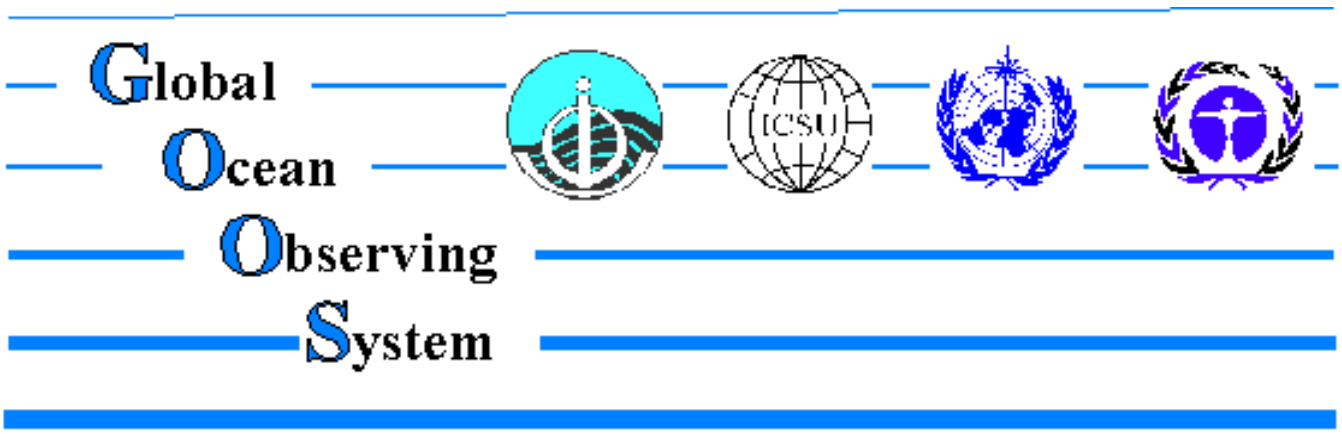

Intergovernmental Oceanographic Commission

Training Course Report

Fifth IOC/WESTPAC Training Course on NEAR-GOOS Data Management

Japan Oceanographic Data Centre

Hydrographic Department

Japan Coast Guard

Tokyo, Japan

5 – 16 November 2001

GOOS Report No. 121

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IOC Training Course Report No.
Paris, June 2002
English only

Abstract

This report presents a summary of the Fifth IOC/WESTPAC Training Course on NEAR-GOOS Data Management, which was organized by the Japan Oceanographic Data Center (JODC) under the auspices of the IOC, from 5 to 16 November 2001 at the JODC, Hydrographic Department, Japan Coast Guard, Tokyo, Japan. Six participants from China, Republic of Korea, the Russian Federation, Philippines, Thailand and Vietnam were selected by IOC and JODC. The objectives of the training course were to disseminate concepts and functions of NEAR-GOOS in the WESTPAC region and to allow participants to become acquainted with the acquisition, processing and exchange of oceanographic data. Lectures, amongst others covered the topics of the framework of the International Oceanographic Data and Information Exchange (IODE) programme, processing and management on various marine data and information. In addition the participants were asked to present country reports regarding data management and the state-of-the-art in the field of marine observation in their respective countries.

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1. INTRODUCTION

An annual "Training Course on the Oceanographic Data Management for WESTPAC" has been organized since 1982 by the Japan Oceanographic Data Center (JODC) in support of the activities of the IOC Sub-Commission for the Western Pacific (WESTPAC). With the commencement of NEAR-GOOS in 1996, the training course on Oceanographic Data Management broadened its scope and was henceforth named "IOC/WESTPAC Training Course on the NEAR-GOOS Data Management".

The Fifth IOC/WESTPAC Training Course on the NEAR-GOOS Data Management was organized by JODC under the auspices of the IOC and with financial support from the UNESCO/Japan FIT (506RAS44) Project, from 5 to 16 November 2001 at JODC, Hydrographic Department, Japan Coast Guard, Tokyo, Japan.

The objectives of the training course were to disseminate concepts of NEAR-GOOS and its functions in the WESTPAC region and to allow participants to become acquainted with the acquisition, processing and exchange of oceanographic data in accordance with principles used within the framework of the International Oceanographic Data and Information Exchange (IODE) programme.

2. PARTICIPANTS

The IOC announced the training course through its Circular Letter No. 1696 dated 20 June 2001 to all Member States. The application requirements were that applicants should possess adequate background knowledge in the field of oceanographic data management, preferably with a responsibility in the collection, archiving and exchange of oceanographic data and management at the national organizations relevant to NEAR-GOOS, and that they should have a good command of the English language.

Fourteen applications were received from eight Member States of the WESTPAC in response to the IOC Circular Letter. Out of these, six participants from China, Korea, Russia, Vietnam, Thailand and Philippines were selected by the IOC and the JODC (see Annex•).

3. TRAINING COURSE

3.1 OPENING

The training course was officially opened on 5 November 2001 by Dr. Tadahiko KATSURA, Director of Japan Oceanographic Data Center, Hydrographic Department, Japan Coast Guard, Tokyo, Japan. In his opening remarks, Dr. KATSURA reminded the participants and the lecturers that the aim of this training course is to improve the levels of oceanographic data management, both in real time and non-real time and to facilitate mutual data exchange in Western Pacific Regional countries, and thus contribute to the Global Ocean Observing System. To achieve these aims, JODC invited six lecturers in addition to the staff members of Hydrographic Department and JODC: Prof. Dr. Keisuke TAIRA and Associate Prof. Dr. Yutaka MICHIDA, Ocean Research Institute, University of Tokyo, Mr. Naoyuki HASEGAWA, Japan Meteorological Agency, Dr. Yutaka NAGATA, Director of Marine Information Research Center, Japan Hydrographic Association, Mr. Tsuyoshi SHIOTA, GOOS Project Office, IOC and Mr. Greg Reed, Ocean Services Section, IOC.

Furthermore, he stressed that since oceanographic data exchange was one of the most efficient and important aspects of the international cooperation, the participants' role, not only in their own country but also in the international oceanographic community, would become more important.

Finally he expressed that mutual friendship and understanding between participants and related organizations was one of the important factors for efficient data and information exchange.

3.2 OUTLINE OF THE COURSE PROGRAMME

The program covered various subjects such as the functioning of the NEAR-GOOS, Regional Real Time Data Base and Regional Delayed Mode Data Base, the method of processing and managing oceanographic data and information, an outline of the activities of JODC, the concept of the IODE program and practical training on the usage of personal computers and workstations in data management and quality control. Study visits to relevant organizations such as the Japan Meteorological Agency (JMA) were also included. In addition, the course contained new training components, those being biological data management and the self-learning module "IODE Resource Kit" which is prepared and published by the IODE/IOC. The latter module was included in the training in accordance with the recommendation made by the Fifth Session of the NEAR-GOOS Co-ordinating Committee.

Course materials distributed to the participants are as follows:

(i) Activities of JHD and JODC (brochure)
(ii) IODE Resource Kit (CD-ROM)
(iii) Manual on International Oceanographic Data Exchange (IOC Manual and Guide 9, Revised Edition, 1991)
(iv) NEAR-GOOS (manual V2.0, Revised Edition 1998) (brochure)
(v) Oceanographic Data and Information Management Text Books prepared by JODC
(vi) Oceanographic Data Processing Text Books prepared by each lectures (CD-ROM)
(vii) WOCE Operations Manual (Last Revision Nov. 1994)
(viii) Activities of MIRC (brochure)
(ix) Activities of JMA (brochure)
(x) Activities of PARI (brochure)
(xi) Activities of NRIFS (brochure)

3.2.1 International Oceanographic Data and Information Exchange (IODE) System

An introduction to the IODE Resource Kit was given. This Kit was developed by the IODE/IOC in order to support Oceanographic Data Centers and improve the technological skills of the staff. Using this Kit, a lecture was given on such topics as the basic ideas and history of the IODE system, the functions, duties and data policies of the World Data Centers (WDCs), Responsible National Oceanographic Data Centers (RNODCs) and National Oceanographic Data Centers (NODCs). The lecture also introduced the software for quality control of observation data as contained on the IODE Resource Kit CD-ROM.

The lecture further briefed the participants on MEDI (Marine Environmental Data Information Referral Catalogue) and elaborated on the management of meta information using the MEDI Software.

3.2.2 IOC/WESTPAC and NEAR-GOOS

Lectures were given on the organizations, methods of operation, and activities using homepages of the IOC and the NEAR-GOOS on the Internet. Also, examples of international cooperation studies were given, thus placing emphasis on the importance of international cooperation for oceanographic studies.

3.2.3 Activities of JODC

An outline of the JODC was presented to the participants focusing on its activities as the NODC. A detailed explanation followed on the collection of oceanographic data and information from the originators, the subsequent data processing flow and handling of data files.

In addition, lectures were given on data exchange in the WESTPAC region, explaining the activities of JODC as the RNODC for the WESTPAC. It was noted that JODC was also acting as the RNODC for the Integrated Global Ocean Services System programs (IGOSS), the RNODC for the IOC Marine Pollution Monitoring programme (MARPOLMON) for the WESTPAC region, and the RNODC for Acoustic Doppler Current Profiler (ADCP) measurements. The lecture outlined the tasks of the RNODC for the WESTPAC including the procedures for forwarding and disseminating oceanographic information, procedures for forwarding data and data announcements and the retrieval of data and information through the WESTPAC program.

Finally a short presentation was given on the GODAR-WESTPAC Project (Global Oceanographic Data Archaeology and Rescue Project in the WESTPAC region) , which was adopted at the 16th Session of the IOC Committee on IODE.

3.2.4 NEAR-GOOS Data Management

3.2.4.1 Real Time Data Base (RTDB)

This session covered the detailed method of real-time data exchange under IGOSS, explaining the type of data and the historical background of the data exchange system and the efforts of NEAR-GOOS to increase the number of participating institutions.

Lectures were given on the current real-time data exchange framework of NEAR-GOOS and the roles of the Regional Real Time Data Base (RRTDB) and the respective Real Time Data Base in each country. Also, the effectiveness and importance of real-time oceanographic data were pointed out based on examples of monitoring and forecasting of an El Nino event. Further information was given on the current status of data assimilation and its potential application in various fields once data assimilation using real-time data is advanced in the future.

3.2.4.2 Delayed Mode Data Base (DMDB)

This section covered an explanation on the system configuration of the Regional Delayed Mode Data Base (RDTDB), on how oceanic data is managed, and the relationship between RRTDB and RTDB, and how to obtain an authorization for downloading data online.

3.2.5 Procedure of Observation Data

3.2.5.1 CTD and BT

CTD and temperature measurements (through XBT and AXBT etc.) were outlined, and the importance of quality control for observation data was pointed out. Lectures were made on CTD data processing procedures, methods of correcting various data including water temperature, salinity, water pressure, and a number of specific procedures to be followed by data producers.

3.2.5.2 Ocean Current Data

The various instruments for oceanic current measurement, such as GEK, Moored current meter, ADCP and surface drifters, were introduced. Particular emphasis was put given on the principle of measuring ocean currents by Shipboard ADCP, procedures for

subsequent data processing, reasons why error data occur and methods of correcting such error data, and on the application of quality control procedures.

Further information were given on the Surface Velocity Programme of WOCE, the data management system of drifters and the Drifting Buoy Cooperation Panel (DBCP) and their significance to the study of various oceanic phenomena such as the subtropical counter current in the North Pacific, variability of the Indonesian throughflow and so on.

3.2.6 Information Management

This lecture stressed the purpose, necessity, and importance of the management of observed data and observation information through National Oceanographic Programmes (NOP) and Cruise Summary Reports (CSRs).

The information management for NOPs and CSRs at JODC were shown on workstation. The participants were informed that JODC annually publishes and distributes them to IOC Member States through the RNODC Activity Report. At the same time, participants were reminded that the submission of CSR to JODC is required because JODC is the RNODC for the WESTPAC.

3.2.7 Data Management

3.2.7.1 Oceanography

The following lectures were given on the basis of the data management procedures adopted by the JODC:

(i) Methods and procedures of obtaining data from organizations that conduct observation.
(ii) Methods of converting data provided in various forms or by different devices (digital or analog data and written reports), to standard formats.
(iii) Explanation of Standard JODC Format for individual data items.
(iv) Methods of checking observation positions and date and time of observation.
(v) Methods of checking data range, gradients, observing water depths and density.
(vi) Definitions and setting of flags corresponding to the results of various checks.
(vii) Merging of observation data into a master file after quality inspection, and the need to duplicate check at that time.
(viii) Importance of maintaining branch files to backup the master file and methods of maintaining records prepared for emergency situations.
(ix) How to respond to users requesting data.

3.2.7.2 Marine Biology

In order to efficiently manage marine biological data using the computer, the JODC has developed two databases, one called "JODC Taxonomic Code of Marine Organisms (Plankton)" that has codified marine organisms in a way compatible with the taxonomic system, and the other, "Marine Biological Observation Data" provided by oceanographic research organizations.

The lecture touched on the importance of marine organisms data in understanding changes in the global environment, problems related to data processing, and structural and managerial problems.

3.2.8 Practical Training

3.2.8.1 External Data Base (J-DOSS and RDMDB)

In 1995 the JODC developed an Internet system called “J-DOSS: JODC – Data Online Service System” that provides

oceanographic information and data to users online. JODC is presently operating the system.

Lectures on the hardware and software in support of J-DOSS were given by explaining the WWW JODC homepages released on J-DOSS. After the lecture, trainees accessed the J-DOSS using personal computers leased to all trainees, and performed queries for downloading particular sets of information and data. They also accessed the RDMDB of NEAR-GOOS to similarly learn the methods of operation.

3.3 STUDY VISIT

3.3.1 Hydrographic Dept., Japan Coast Guard (JHD)

A study visit to JHD was conducted in the morning of 6 November. Firstly, the brochure *Striving for revealing oceans scientifically and safe navigation at sea* was distributed to the participants for their reference and an outline of the activities of JHD was introduced during the tour.

A demonstration on the Electronic Chart Display and Information System (ECDIS) was provided by using the Electronic Navigational Chart (ENC) of Tokyo Bay. The usefulness of the navigational information combined with the nautical chart information from ENC was explained at the Cartography Office. Special attention was also given to the situation of oceanographic observation and monitoring of marine pollution, a system of trajectory prediction and information on oceanic conditions as conducted by the Ocean Surveys Division.

3.3.2 Ocean Research Vessel "SHOYO"

In the afternoon of November 9, the trainees visited the Ocean Research Vessel, SHOYO, owned by the Japan Coast Guard. The SHOYO, completed in 1998, has a gross tonnage of 3,000 GT. It is mainly surveying the bottom topography and geology and the ocean environment in the North Pacific region. The trainees learnt about the various survey equipment onboard which include a Narrow Multi-beam Echo Sounder, a Seismic Profiling System for Deep-Sea, a Continuous-flow Analytical System, an Auto-Salinometer and a CO_2 Meter.

3.3.3 Japan Meteorological Agency (JMA)

On 12 November, the participants visited the Japan Meteorological Agency (JMA), and received a lecture on the NEAR-GOOS Real Time Data Exchange System in the morning. In the afternoon, a study tour was carried out during which the participants were briefed on;

(i) JMA's data collection/processing activities for physical oceanographic services. The hardware for the NEAR-GOOS Real Time Data Base was also shown, and some of the data base capabilities were demonstrated.

(ii) The Ocean Data Assimilation System for El Nino monitoring. It was shown that the system gave useful information for the early detection of the El Nino event of 1997-98.

(iii) The JMA's wave analysis and forecast activities. The numerical ocean wave prediction models calculate evolution of wave conditions based upon the equations of wave dynamics using the surface wind data given by numerical weather prediction models of JMA.

(iv) The JMA's activities related to the sea ice monitoring and the pollution chemical analysis.

(v) The operational global and limited area numerical weather prediction models. Some output from the numerical models and data assimilation systems were demonstrated.

(vi) The weather forecast services at JMA. The major services are to issue the weather forecasts in short-range, one-week, and long-range; the warning/advisories for typhoon and heavy rainfall/snowfall; the warning/forecast for tsunami; storm surge, ocean waves and flood; and information on earthquake and volcanic activities.

3.3.4 Port and Airport Research Institute (PARI)

In the morning of November 15, the trainees visited the PARI. The PARI was established on April 1, 2001, as a specific independent administrative institution to conduct investigation, research and technical development for the construction of ports, coasts and airports.

The trainees inspected the experimental facilities owned by the PARI such as the Underwater 3D Shake Table and the Intelligent Wave Basin for Maritime Environments, and learnt about NOWPHAS (Nationwide Ocean Wave Information Network for Ports and Harbors), a system for collecting and analyzing the observation data obtained using wave recorders installed in 49 coastal zones across the country.

3.3.5 National Research Institute of Fisheries Science (NRIFS)

In the afternoon of November 15, the trainees visited the NRIFS which is conducting research on fisheries resources, the ocean environment, and fish culture.

First, the trainees were introduced to the NRIFS operations by watching a video tape, and heard a lecture on such topics as the changes in the oceanic conditions in the area south of Honshu. After this, they inspected a fish culture experimental facility for fish and shellfish, a satellite data reception and analysis system and were given a lecture on the method to analyze oceanic conditions in areas around Japan using this system.

3.4 COUNTRY REPORTS

Country Reports were presented by the six participants. This session provided useful information to the JODC staff and participants with regard to the oceanographic data management and state-of-the-art in the field of marine research in the region. The Country Reports are shown in Annex III.

3.5 CLOSURE

The training course was completed on 16 November. Dr. Tadahiko KATSURA, Director of the JODC, congratulated the participants for their fruitful completion of the course, which had been run with the assistance of IOC and the Ministry of Education, Culture, Sports, Science and Technology of Japan, and other related organizations.

He mentioned that he believes this course could provide the participants with knowledge of basic oceanographic data management, both in real time and non real time as well as information on the JODC activities. He pointed out that this course would enable good human relations among the participants and between the participants and the JODC staff, and that the participants were very welcome to contact the JODC for further information and technical assistance.

On behalf of the participants, Mr. Young Bae Kim thanked the JODC for organizing the course and the IOC for providing

them with an opportunity to take part in this training course.

Each of six participants was awarded a certificate signed by the Executive Secretary of the IOC and the Director of the JODC, indicating that they had successfully completed the training course.

4. COURSE EVALUATION

On 16 November, all the participants submitted evaluation reports on the training course. A summary of the evaluation is given below.

4.1 Local Arrangements

Accommodation, lecture conditions including facilities and classroom, and assistance of JODC staff members were evaluated as excellent.

4.2 Length of Course and Materials

The trainees evaluated the length of course and training materials as suitable as a whole. However, Thai and Philippine trainees pointed out that they wanted more time to undergo practical training on ocean data quality control and database management.

4.3 Lectures

The trainees evaluated that most of the lectures were valuable, and that they could use the knowledge and technologies they gained in processing and managing data in the future. They particularly highly evaluated the lectures "Serial Station and Ocean Current Data Processing", "Quality Control of Oceanographic Data using IODE Resource Kit" and "Lecture on Practice Data Management by PC".

4.4 Study Visit

The trainees felt all the places they visited were valuable in expanding their knowledge and learning about the state-of-the-art observation equipment. They particularly liked the visits to the Japan Meteorological Agency (JMA) and the ocean research vessel SHOYO.

4.5 Suggestions for Improving the Course

All of the participants were satisfied with the course arrangement and the following specific comments were made

(i) It was pointed out by the Thai and Vietnamese trainees that the training could have been more effective if more details on the schedule and content of this training course were provided to all trainees in advance.
(ii) The trainee from the Philippines pointed out that she thought that the training course for quality control of data using personal computers could be strengthened.
(iii) A trainee from China suggested that more techniques on data management and data service would be introduced.

4.6 Conclusions

To enrich the contents of the training and make them more effective, according to the recommendation by the Fifth Session of NEAR-GOOS Co-ordinating Committee, this time's training course included a lecture using the IODE Resource Kit, as well as a lecture

on marine organisms data management. The trainees evaluated both these lectures to be valuable. Therefore, the JODC would like to include these lectures in the future training courses, as well as lectures on the management of marine chemical data such as on carbon dioxide necessary for the analysis and forecast of changes in the global environment.

ANNEX I

COURSE PROGRAMME

Date	10:00 - 12:00	lunch time	13:30 - 16:00
5/11/2001 Monday	Opening Ceremony and Course Orientation		Lecture on IOC/WESTPAC and its activities (incl. NEAR-GOOS) Dr. Taira, ORI, Univ. of Tokyo
6/11/2001 Tuesday	Study Visit to:		Country Report Introduction of Oceanographic Data Management in the Participant Country
7/11/2001 Wednesday	Lecture on Serial Station Data Processing Mr. Imoto, JHD		Introduction to the IODE Resource Kit and Lecture on MEDI Mr. G. Reed, IOC/IODE
8/11/2001 Thursday	Lecture on Oceanographic Data and Information Management in JODC Mr. Shimizu, JODC		Lecture on Quality Control of Oceanographic Data using the IODE Resource Kit Mr. G. Reed, IOC/IODE
9/11/2001 Friday	Lecture on Research for Ocean and Utilization and Management Dr. Nagata, MIRC		Study Visit to: Ocean Research Vessel "SHOYO"
10/11/2001, Saturday 11/11/2001, Sunday			
12/11/2001 Monday	Lecture on NEAR-GOOS Real Time Data Base Exchange System Mr. Hasegawa, JMA		Study Visit to:
13/11/2001 Tuesday	Lecture on Ocean Current Data Processing Dr. Michida, ORI, Univ. of Tokyo		Lecture on Marine Biological Data and Tidal Data Management Mr. Chiba and Mr. Toyoshima, JODC
14/11/2001 Wednesday	Lecture on Practice of Data Management by using PC Mr. Miyake, JODC		Lecture on Practice of Data Management by using PC Mr. Miyake, JODC
15/11/2001 Thursday	Study Visit to: - Port and Airport Research Institute - National Research Institute of Fisheries Science Mr. Toyoshima and Mr. Kyuma, JODC		
16/11/2001 Friday	Course Evaluation and Closing Ceremony		Customized Special Study

ANNEX II

LIST OF THE PARTICIPANTS

1. INVITED TRAINEES

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2. INSTRUCTORS

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Assosi. Prof.. Dr. Yutaka Michida
Ocean Research Institute, ORI, UT

Mr. Naoyuki Hasegawa
Senior Scientific Officer, Japan Meteorological Agency (JMA)

Dr. Yutaka Nagata
Director, Marine Information Research Center (MIRC)

Mr. Taiji Imoto
Principal Officer, Ocean Research Laboratory, Planning Division

Dr. Tadahiko Katsura
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Japan Oceanographic Data Center (JODC)
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Japan Coast Guard

Mr. Satoshi Sato
Deputy Director, JODC

Mr. Shigeru Toyoshima
Senior Research Officer, JODC

Mr. Yoshio Shimizu
Research Officer, JODC

Mr. Takeharu Miyake
Research Officer, JODC

Mr. Baba Norio
Research Officer, JODC

Mr. Tsuyoshi Chiba
Research Officer, JODC

3. SECRETARIAT

Mr. Shigeru Toyoshima
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Research Officer, JODC

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Assistant Research Officer, JODC

Mr. Yuichi Kyuma
Assistant Research Officer, JODC

Ms. Akiko Honma
Assistant of International Affairs, JODC

ANNEX III

COUNTRY REPORTS

A - CHINA

Re-Structured NMDIS and Oceanographic Activities

Huifen Xue
National Marine Data and Information Service

Objectives of Re-structured NMDIS

Based on the functional shifting of the State Oceanic Administration towards the management of sea area use and marine environmental protection, National Marine Data and Information Service (NMDIS) has re-organized its structure and re-orientated its functions. NMDIS was designated as a public benefited institutions directly under the State Oceanic Administration. The main responsibilities of NMDIS are to manage national marine information resources and providing information service and technical support for the ocean management, marine economic development, the protection of national marine rights and interests, protection of marine environment, and to provide coordination and guidance of national marine data and information management. The re-organized NMDIS has divided into three systems: management system, programmatic development system and S & T support and service system.

I. Management system

II. Programmatic Operational System

Marine Data Center

Marine Data Center is responsible for the collection, processing, and management of national marine basic data, establishment and maintenance of national marine database; responsible for the development of rules and regulations, technical standard which related to marine data management; as a focal point, responsible for international marine data and information exchange; operating the WDC-D for Oceanography.

System Network Center

It is responsible for the establishment and maintenance of national marine information transmission network; establishing, maintenance and management of "China Oceanic Information Network (COINet); providing technical support for the hardware and software maintenance.

National Marine Archives

It is responsible for the collection, processing, and archive all the records and files relating to ocean survey, marine monitoring and marine science and technology research, and providing service to varies users.

National Marine Library

This library acts as a national center for the collection, processing storage, retrieval and providing service of the books, periodicals, maps and literatures in the field of marine science and technology. It is also a China's National Center for the Aquatic Science and Fisheries information system (ASFIS) of the United Nations as well as a China's National Documents Depository Center of UNESCO/IOC.
It has completed the marine literature database in both Chinese and English and its computer-aided marine literature retrieval system.

Department of Marine Environmental Assessment and Prediction

This Department is responsible for the establishment of special and comprehensive marine environmental information system and conducting research on sea level changes and marine disaster mitigation; responsible for tidal and tidal current prediction; compiling tide tables for China Seas and the world oceans, as well as China Sea Level Bulletin.

Department of Coastal Economic and Resources Management

The main functions of the Department is to conduct investigation on the management of sea area resources as assets, study on the evaluation and price structure of sea area use; Conducting of functional zoning and development plan; establishment and maintenance of coastal zone management information system; conducting marine economic and social development statistics; responsible for the establishment and maintenance of marine economic and resources information system.

Department of Marine Strategy and Policy Studies

The main functions of the department is to conduct studies on principles and policies relevant to the defending of marine rights and interests of the country; providing information service to the decision-makers on maritime delimitation; study on marine basic law and regulations related to China's territorial sea, exclusive economical zone and the continental shelf; establish and maintenance of information management system for marine laws and regulations and maritime delimitation.

Department of Marine Remote Sensing and Geographic Information

It is responsible for the establishment and maintenance of marine basic geographic information system, providing products service with basic geographic information products of different scales; responsible for the collection, processing, management and providing service of marine mapping data; conducting applied technical research on marine remote sensing, geographic information system and global positioning system, and develop information products; establishment of special marine maps database; set up and uphold information system for the law enforcement and supervision of sea area delimitation; set up automatic marine chart making system, providing marine chart information products of different type; undertake compiling of International Bathymetric Chart for the Western Pacific.

China Operational Center of the International Ocean Institute (Tianjin Training Center of the State Oceanic Administration)

The main task of China Operational Center of International Ocean Institute is to implement training plans of International Ocean Institute and undertaking training courses for the IOI, carrying out cooperation and exchange with IOI Headquarters and other Operational

Centers; conducting post-graduate education programs in cooperation with Qingdao Ocean University and organize other training courses according to the needs of the society or entrusted by the State Oceanic Administration.

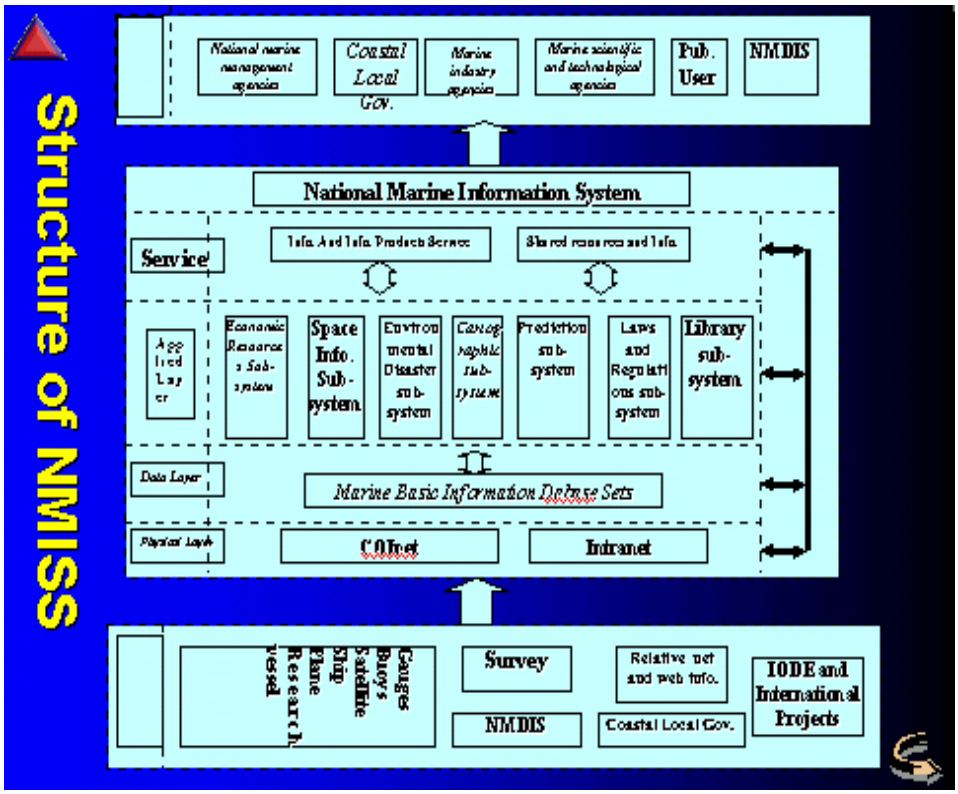
III. Scientific Support and Service System

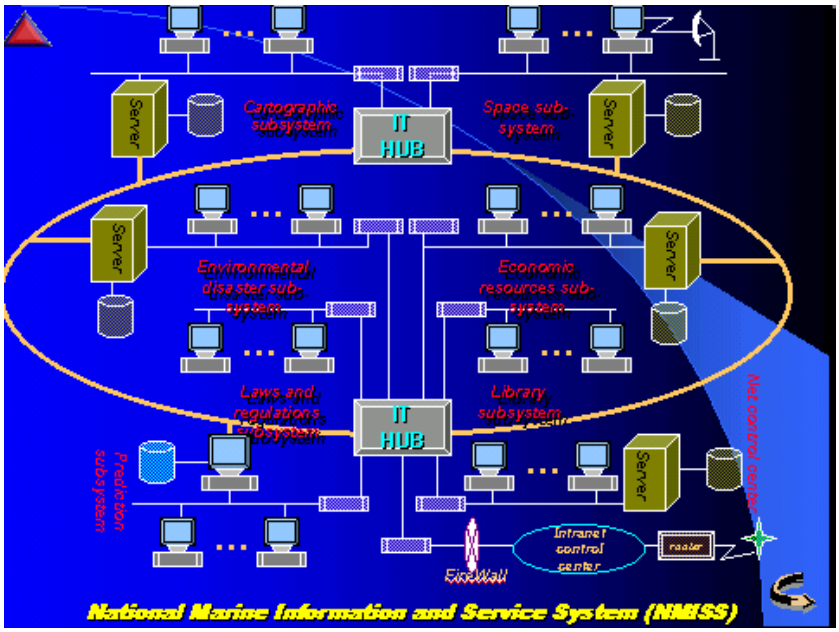
1. Oceanographic Activities

(1) Established the National Marine Information System

The functions of NMISS are followings:

Data collection and acquirement
Data pre-processing
Database management
Data inquiry and retrieval
Data disseminated by web, FTP and others such as recordable CD-ROMs, magnetic tape and diskette
Integrate analysis
Shared service and information release on web site





(2) Establishing the Basic Data Bases of WDC-D Oceanography

The project is financially supported by the Ministry of Science and Technology (MST). The main works are followings:

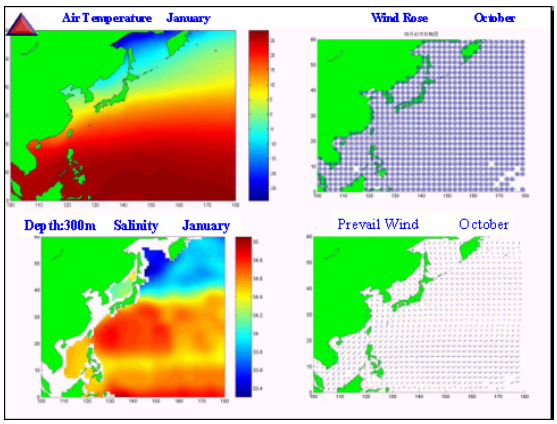
(i) Establishing the metadata information standard;

(ii) Collecting and processing the marine metadata information and establishing the metadata information database.

(iii) Establishing the Statistic Products Database and the Quality Control System.

(iv) Processing a large amount of historical data.

(v) Establishing the Basic Database sets.



(3) Data Rescue project between China and USA

The historical marine data about 20 years has been rescued. The work is composed of the data medium change from paper to magnetism and data quality control. The data set will be very useful for the research of marine long-term change.

2. Works on NEAR-GOOS

(1) Operation of CDMDB

China NEAR-GOOS Delayed Mode Data Base (CDMDB) is running well at present. A special group in NMDIS is working on the CDMDB. Up to now, the access to the website of the CDMDB has amounted to over 10,000 person-time. The users groups are mostly from universities, institutes, societies and the marine management departments of the governments at various levels in China and foreign

relevant organizations and scientists. Their purposes on using the data are various. E.g. study and research, data exchange, co-operation, to monitor the data status and so on.

(2) Management on CDMDB

NMDIS are responsible for the maintenance and management of the database, including data collection and quality control, data loading, data transferring from RTDB to DMDB, development of data products, monitoring the uses of the data bases and further development of data base management techniques, etc. At present, the data loaded into the CDMDB will be update once every month.

(3) Accessing CDMDB

The CDMDB can be accessed by all users who are interested in obtaining or providing data. The on-line registration system has been created in the homepage. Only the registered users can access the CDMDB.

(4) Types and Products of Data in the CDMDB

(i) Buoy data provided by NMEFC (National Research Center for Marine Environmental forecasts) of China, MOMAF (Ministry of Maritime Affairs and Fisheries) of Korea and KMA (Korea Meteorological Administration)

(ii) Ship of Opportunity Data provided by NMEFC of China.

(iii) Station Data provided by NMEFC of China and NMDIS of China.

(iv) SST Data

(v) GTS Data provided by NMEFC of China is composed of radio sounding data, surface meteorological data and ship meteorological data.

All information about CDMDB could be gained from the web site of China NEAR-GOOS (http://Near-goos.coi.gov.cn). Welcome to use the CDMDB and to conduct data exchange and sharing

B-KOREA

NEAR-GOOS Activities in Korea

Young Bae Kim
Marine Development Division, Ministry of Maritime Affairs and Fisheries,

RELATED ORGANIZATION for NEAR-GOOS in KOREA

Ministry of Marine Affairs and Fisheries (MOMAF)

The Ministry of Marine Affairs and Fisheries (MOMAF) has been newly established on Aug. 8, 1996 to develop and coordinate a comprehensive and systematic marine administration system.

Main functions of the Ministry include development and coordination of marine and fisheries-related policies, promotion of the shipping industry and safety navigation of vessels, facilitation of port operations and port development, promotion of the fisheries industry and support for the development of marine resources.

MOMAF is organized with three offices (Planning and Management Office, Maritime Safety Management Office, International Cooperation Office), five Bureaus (Marine Policy Bureau, Shipping and Logistics Bureau, Port and Harbor Bureau, Fisheries Policy Bureau, Fishery Resources Bureau) and Marine Police Administration, National Fisheries Research and Development Institute, National Oceanographic Research Institute, National Fishing Product Inspection Office, Fishing Control Office and eleven regional Marine and fisheries Administrations under the authorities of the Ministry.

Marine Policy Bureau of the Ministry is to develop and coordinate comprehensive mid to long-term plans regarding marine and fisheries including GOOS and NEAR-GOOS activities.

National Fisheries Research and Development Institute (NFRDI)

National Fisheries Research and Development Institute (NFRDI) was established in 1921 as the Fisheries Experiment Station and was reorganized in 1996 as National Fisheries Research and Development Institute (NFRDI) under the Ministry of Marine Affairs and Fisheries.

Main functions of NFRDI are marine research, experiments and education for the development of the fisheries industry including studies on variability of ocean and fishing ground environment.

NFRDI is organized with four departments (Fisheries Resources Department, Aquaculture Department, Marine Environment Oceanography and Harmful Algal Blooms Department and Training Department), three regional Fisheries Research Institute (East Sea Fisheries Research Institute, West Sea Fisheries Research Institute, South Sea Fisheries Research Institute)

NFRDI has been carrying out marine scientific research in Korean waters (sea surface temperature, salinity, etc.) with 15 marine scientific research vessels and operating KODC (Korean Oceanographic Data Center)

National Oceanographic Research Institute (NORI)

National Oceanographic Research Institute was established in 1949 as the Korean Hydrographic Office and was reorganized in 1996 as National Oceanographic Research Institute (NORI) under the Ministry of Marine Affairs and Fisheries.

Main functions of NORI are hydrographic survey, oceanographic observation and tide observation, nautical charting, publishing notice to mariners and servicing ocean data and information.

NORI is organized with four divisions (General Affairs Division, Oceanographic Division, Survey Division and Nautical Charts Division) and three regional offices (Busan, Tonghae, Janghang). NORI is operating a total of six survey vessels including the largest S/V Hangyang 2000(G/T 2,533).

NORI has a responsibility to international development in the area of hydrographic affairs through the exchange information and by building relationships as a member state of International Hydrographic Organization.

Korean Ocean Research and Development Institute (KORDI)

Korean Ocean Research and Development Institute (KORDI) was established in 1973 as Ocean Research Institute of the Korea Institute of

Science and Technology (KIST) and reorganized in 1990 as independent comprehensive ocean research institute.
KORDI has been carrying out a comprehensive survey and study of Korea's waters and open seas, conducting scientific research in Antarctica, developing technologies related the coastal and harbor engineering, ships and ocean engineering and maritime safety and coordinating international cooperation concerning oceanographic projects etc.

PRESENT ACTIVITIES for NEAR-GOOS

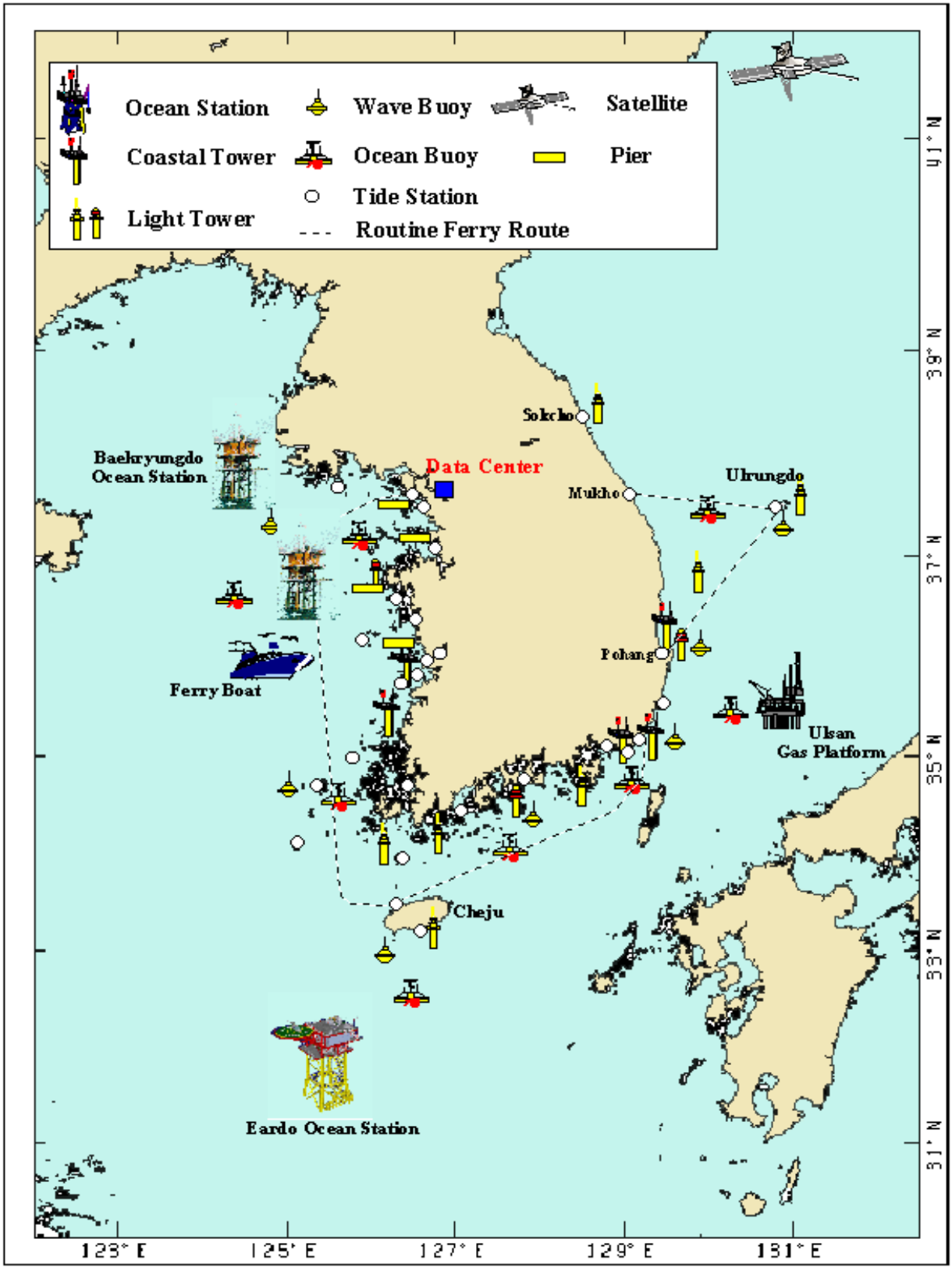
Republic of Korea has been participating in NEAR-GOOS coordinating committee with four member states (Republic of Korea, Japan, China and Russia) since 1996.
The fifth NEAR-GOOS coordinating committee was held on Dec. 6-8, 2000 and the sixth NEAR-GOOS coordinating committee was held on Dec. 6-8, 2000 in Seoul supporting by MOMAF. MOMAF is supporting continuously to implementation of NEAR-GOOS with NFRDI, NORI and KORDI.
Real-time data-base is tested by KORDI (Korea Ocean Research and Development Institute) with the support of MOMAF. The major real-time data available at present is wave measurement data (four stations) from the MOMAF's wave monitoring program and marine meteorological data (five wave buoys) from KMA (Korea Meteorological Administration)'s Ocean Data Buoy program. KORDI had build a demonstration web-site to provide real-time ocean data in the region by collecting available data from web sites established by the real-time data producers in Korea and also from NEAR-GOOS Real Time Data Base (RTDB) of JMA and China Real Time Data Base. Based on such experiences in handling real-time data service through internet Web site, MOMAF is planning to operate the official National RTDB with the technical support from KORDI.

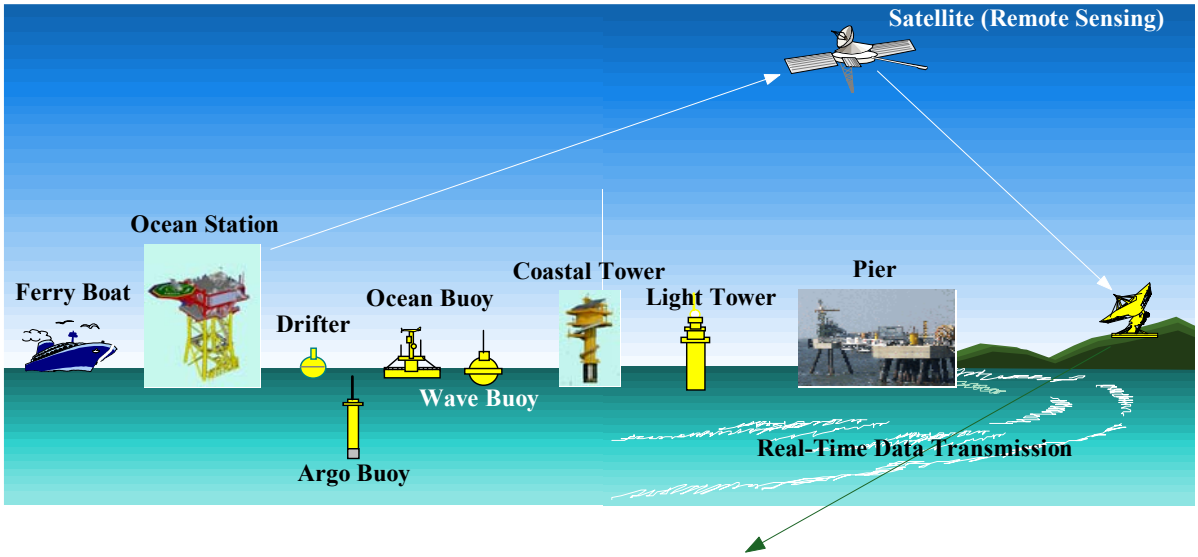
National Fisheries Research and Development Institute (NFRDI) had been establishing DMDB. Data Base for the oceanographic data measured for the waters around Korean peninsular has been established. The interfacing with RTDB has not yet tested. It will be fully operational in the near future.

THE BASIC PLAN FOR THE IMPLEMENTATION OF REAL-TIME COASTAL AND OCEAN MONITORING SYSTEM IN KOREA

Ocean and coastal observation activities in Korea have been carried out by National Oceanographic Research Institute (NORI), National Fisheries Research & Development Institute (NFRDI), Korea Meteorology Administration (KMA), universities and research institutes independently of others. These ocean and coastal data contributed greatly to the fisheries, marine transportation, coastal development and reduction of coastal disasters in Korea. But most of the ocean observation activities are carried out using traditional instruments and methods in non real-time, except for the coastal wave network of the MOMAF and meteorological observation of KMA. One of common problem of the ocean observation systems of Korea is the difficulty in operating offshore observation station to collect data representative of the region in real-time and in building the expensive ocean platforms for real-time observation.
MOMAF has designed a long-term implementation plan (up to 2010) for the establishment of a real-time coastal and ocean monitoring network (total 91 stations including 8 fixed stations, 20 light beacons, 5 dolphins, 20 wave monitoring buoys, and 38 tide stations). It can be established in addition to the existing system for the marine meteorological and environmental monitoring in real-time in h cooperation with NFRDI, NORI, KORDI and KMA. Fig. 1 shows the designed the real-time coastal and ocean monitoring network in Korea.

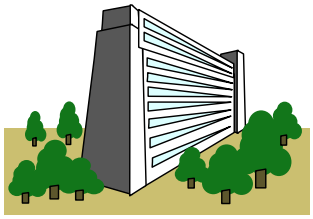
Fig. 1 Long-term Plan for Coastal Real-Time Monitoring Network in Korea





Data Center

Real-Time data
- Temp., Sal., Turidity
  Chlorophyll
- pH, DO
- Wave, Tide, Storm Surge
- Wind Speed, Wind Dir.
- Air Temp. , Air pressure



NEAR-GOOS

- Data Acquisition, Analysis
- Data Quality Control, Management
- Numerical Modelling

Utilization of Data

- MOMAF
- NFRDI
- NORI
- KMA
- NAVY
- MOE
- MOCT
- MARITIME POLICE
- KEPCO
- KARIC
- University, Institute
- Ocean service
- Harbor Construction
- Fishermen, Fishery
- Coastal resident

- Weather forecasting
- Reduction of natural disasters
- Efficient coastal area development
- Marine environmental protection
- Support for maritime activities and ocean industries
- Research of global climate change

Fig.2 Conceptual design of coastal monitoring network

Fig.3 Chuluncho light beacon station

C-RUSSIAN FEDERATION

Oceanographic Data Managementu nder the WESTPAC/NEAR-GOOS in Russia

Natalia Rudykh
V.I. Il'ichev Pacific Oceanological Institute (POI)
Far Eastern Branch, Russian Academy of Sciences (FEBRAS)

Introduction

NEAR-GOOS Project covers the Yellow Sea, East China Sea, Japan Sea and the adjacent areas of the Pacific Ocean. Oceans have no political boundaries, and that is why a country's coastal waters may be affected by events far away. There is an urgent need for near-by countries to exchange data on their common coastal environment.

Traditional science and technical collaboration of Japan, the People's Republic of China, the Republic of Korea and Russia improves year after year thanks to participation of these countries in the NEAR-GOOS International Project carried out under the aegis of IOC/UNESCO. These countries offer a new stage of such cooperation - the cooperation in the sphere of operative collection, accumulation and exchange of data on the marine medium state in the region. The necessity of a new approach the environmental problem is now fully realized, so its global character.

The regional databases on the environment state are currently required while the making decisions on marine and coastal environment management, the nature protection activity. Two data bases: Real Time Data Base storing daily observations and mapping of sea conditions during 30 days, and the Delayed Mode Data Base for archiving, are believed to be an essential function of the NEAR-GOOS.

Data Bases and Data Users in Russia

There are many sea-study organizations in the Russian Far East as well as preceding years:

- Far-Eastern Regional Hydrometeorological Research Institute, Roshydromet (FERHRI, Vladivostok). http://www.hydromet.com/
- Pacific Research Institute of Fisheries and Oceanography (TINRO-Center, Vladivostok). http://www.tinro.ru/.
- V.I. Il'ichev Pacific Oceanological Institute, FEBRAS (POI, Vladivostok). http://www.pacific.marine.su/
- Institute of Marine Biology, FEBRAS (IMB, Vladivostok). http://www.imb.febras.ru/
- Pacific Institute of Geography, FEBRAS (PIG, Vladivostok). http://www.tig.dvo.ru/
- Institute of Automatics and Control Processes, FEBRAS (IACP, Vladivostok). http://www.iacp.dvo.ru/
- Primorye Regional Department of Hydrometeorology and Monitoring of the Natural Environment (PRDHMN, Roshydromet), uniting 10 presently operated coastal stations and posts.
- Hydrographical Service of NAVY (HSN, Vladivostok).
- Sakhalin Department of Hydrometeorology and Monitoring of the Natural Environment (SDHMNE, Roshydromet) - 30 stations and posts. http://www.science.sakhalin.ru/Ecology/Index.html
- Sakhalin Research Institute of Fisheries and Oceanography (SakhNIRO, Yuzno-Sakhalinsk). http://www.science.sakhalin.ru/SakhNiro/
- Khabarovsk Branch of TINRO-Center.

Most of hydrological-hydrochemical observations (temperature, salinity and chemical composition of waters, marine currents, water pollution, radiochemistry, etc) on the Far-Eastern seas and the adjacent regions of the Pacific Ocean was carried out by R/Vs of FERHRI (Roshidromet), TINRO-Center and POI. For instance, TINRO-Center databases are permanently renewed with the information from

marine research cruises as well as retrospective ones (conducted before 1980). Data are condensed in 10-degree squares. Data base structure is presented at matching web-site http://www.tinro.ru/.

Essentially all data are passed to funds of RIHMI-WDC (All Russian Research Institute of Hydrometeorological Information – WDC (B)/NODC Obninsk) where they are transferred to modern technical carriers. Web-site of RIHMI-WDC: http://www.meteo.ru/

IMB, PIG and IACP of FEBRAS also have their own information resources on the Environment State of the land, coastal water areas and unparticular satellite information. These institutes present their work at the corresponding web-sites.

The **Real Time Data Base (RTDB)** for NEAR-GOOS has been created since 1998 by FERHRI to serve as National RTDB for NEAR-GOOS. This base includes the results of regular observations from ships and 30 coastal meteorological stations of the neighboring marine areas. The measured parameters include water and air temperature, salinity, sea level and waves, ice characteristics, meteorological parameters. The information on RTDB for NEAR-GOOS is located on the web-site: http://www.hydromet.com.ru/project/near-goos/.

The **Delayed Mode Data Base (DMDB)** for NEAR-GOOS was created since 1998 by V.I.Il'ichev Pacific Oceanological Institute, the Far Eastern Branch of Russian Academy of Sciences (POI) to serve as National DMDB for NEAR-GOOS. The base involves the results of historical data base of Russian and foreign observations on temperature, salinity, chemical and biological parameters in the Northwestern Pacific including the NEAR-GOOS area. It also includes schemes of oceanographic cruises by POI, FERHRI and TINRO vessels. At the POI web-site has recently been presented the graphical information as maps and vertical sections of the observed parameters. The information on DMDB is located at http://www.pacific.marine.su/cdsdb/ngpdb.htm.

Russian Oceanographic Investigations in the North-East Asia Region in 1997-2001

Since the formal beginning of studies under the NEAR-GOOS Project in 1996, the POI, FERHRI, IMB and TINRO have conducted more than 40 oceanographic cruises in the area of Project studies. During the cruises about 2000 oceanographic stations were carried out in the Japan/East Sea. Last 2 years new data of 7 POI expeditions with around 400 stations, information on implemented in 2000 14 TINRO 3 FERHRI cruises were added to the data base. The last expedition of POI in the Japan/East Sea ended in May 2001.

Further development, creation of information products

For the first time, as the Asian-Pacific Region of Russia is concerned, there were formed the interactive complex information retrieval systems on hydro-meteorological regime, ecology and nature resources of the Far Eastern Seas in POI and FERHRI. The software and the generalized data on the long-term observations performed in the Sea of Japan, the Sea of Okhotsk and the Bering Sea, as well as the results of completed research studies scattered in numerous special scientific transactions and the archives are presented in the form of CD records. The systems will provide of integrated information on the state of marine environment in the region (CD-ROM, Internet) by way of generalizing and visualizing the data for many years observations which actually, as they are, are not yet to be available for free distribution and wide usage.

New electronic and paper atlases of 2001

OCEANOGRAPHIC ATLAS OF THE BERING SEA, OKHOTSK SEA AND JAPAN/EAST SEA

The 1-st version of the interactive information-reference system «Oceanographic Atlas of the Bering Sea, Okhotsk Sea, and Japan/East Sea» involves an integrity of the software and generalized data on the state of marine medium in the region exhibited as tables, pictures and text materials. CD-ROM contains a brief annotated description of data on the main physical-geographical characteristics, peculiarities of hydrological mode, water masses, tidal phenomena, waters circulation and ice conditions in the Far Eastern Seas. It is illustrated vast graphic material (1300 color pictures) characterizing the large-scale background peculiarities of distribution and inter-annual variability of the sea water temperature, salinity, sound velocity, some hydrochemical elements and currents. The disk contains copies of fragments of global climate array of the average monthly GDEM data on temperature, salinity, and sound velocity in the seawater on standard horizons from the surface to the bottom, covering all water area of the seas. It is given a list of the available data bases of free access and the web-sites containing additional operative and archived data on a wide circle of special and interrelated problems of studying and exploring the region. There are applied programs of data selection in respect to the Far Eastern Seas, which are stored on the CD-ROM of Levitus.

The system provides fast access to the specially selected data stored on CD-ROM, and also to other operative or generalized reference information (through Internet) scattered among various sources, and hence, limited for wide use.

MARINE ENVIRONMENTAL ATLAS OF THE JAPAN/EAST SEA COASTAL ZONE OF THE RUSSIAN FEDERATION

It is being prepared in POI. Its structure will be such as the above mentioned. Short information about electronic atlases is presented at POI web-site http://www.pacific.marine.su/

ATLAS OF THE SAKHALIN SHELF (SakhNIRO, IMGIG FEB RAS)

About 48000 stations were used for building this atlas. Special software called "ATLAS" was developed for best applying this electronic atlas to scientific research. The Russian version is displayed at http://www.science.sakhalin.ru/SakhNiro/
Dr. Igor Rostov presented following information on PICES TENTH Anniversary Meeting, Victoria, and B.C., CANADA October 5-13, 2001.

Current activity

Development of the regional web-site and creation of information products on CD-ROM

1. Web-site

Web-site: "Oceanography and Marine Environment of the Far Eastern Region of Russia" – Integrated base of information resources "Ocean Far East on-line" www.pacific.marine.su. Ready on 100 %.

2. CD-ROM series:

- Vol. 1 – Archival Data of POI Cruises (1969-2000). Ready on 100 %. (Russian versions. Available to organizations which exchange data with POI. Distr. restricted.).
- Vol. 2, version 1 – Oceanographic Atlas of the Bering Sea, Okhotsk Sea and Japan/East Sea. Ready on 90 %. (Russian version is available for unrestricted distribution.).
- Vol. 3 – Marine Environmental Atlas of the Japan/East Sea Coastal Zone of Russian Federation. Ready on 70 %. (Russian version will have been available by 2002. Distribution is restricted).
- Vol. 4 – Archival Moored Currents Observations Data for the Northern Pacific. Ready on 50 %. (Russian version will have been available by 2002. Distr. restricted).
- Vol. 5 – Atlas of Trade Marine Invertebrates, Algae and Grasses of the Bering Sea, Okhotsk Sea and Japan/East Sea. Ready on 50 %. (Color printed issue will have been ready to February 2002. Distribution on commercial basis.).

Conclusion

Further improvement in data exchange and communication system for the Region may be expected with a progress of Russian program on creating a Unified System of Information on the World Ocean State (ESIMO) and international projects such as NEAR-GOOS/IOC, NOWPAP/UNEP, LOICS/IGBP, Tumangan/UNESCO. This allows involving a potential of neighbor countries to maintain Russian system of data collection and distribution and to adopt modern technologies of observation, data processing and management. For integration of Russia to major international projects it is required to solve the following problems: (a) elaborate system of regulations that allow Far Eastern marine organizations participate in the international data exchange with their partners easily; (b) to allocate appropriate funds for Far Eastern organizations to keep their activity in these projects.

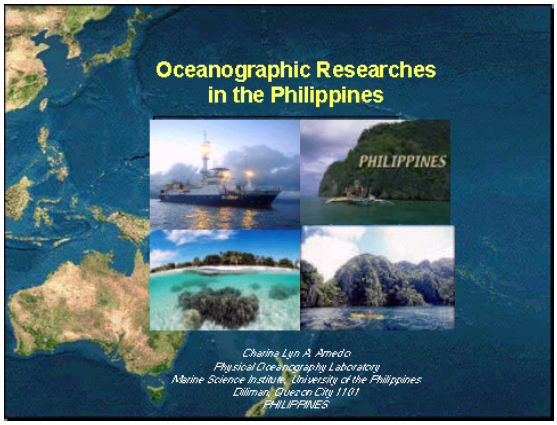
Further technological improvement in operational oceanographic information is related to development of remote sensing. This activity is supported by RFBR, RAS and World Ocean Federal Program and is in progress on two directions: (a) establishing of data receiving centers (such center was recently opened at the Far Eastern Branch of RAS) and (b) developing of new methods for data retrieving, analysis and interpreting.

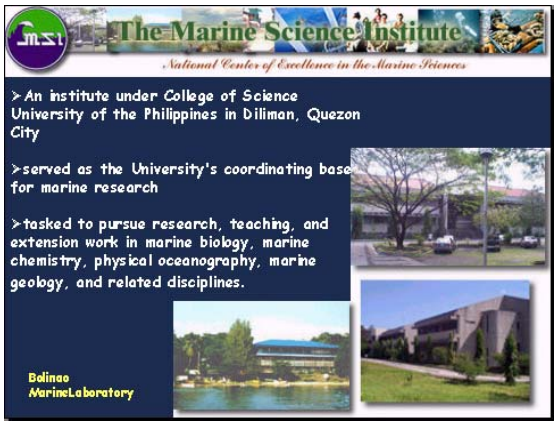
Easy way for cooperation is development and exchange of CD-ROM information products (not only primary data of observations) and to make them available for common use by international community.

D-PHILIPPINES

Oceanographic Researches in the Philippines

Charina Lyn Amedo
The Marine Science Institute, College of Science
University of Philippine





Research Areas

Biology of red tide/harmful phytoplankton
(R. Azanza)

Coral Reef, Seagrass and Mangrove Ecosystems
(P. Aliño, M. Fortes, A. Juinio-Meñez, H. Yap)

Plankton ecology
(R. Azanza, L. McManus)

Research Areas

Invertebrate biology and mariculture
(E. Gomez, S. Licuanan, A. Juinio Meñez)

Seaweed biology, molecular genetics, taxonomy, and culture (R. Azanza, E. Fortes, A. Lluisma, G. Trono)

Nearshore and offshore oceanographic processes
(L. David, G. Jacinto, M. Sandiego-McGlone, C. Villanoy, M. Udarbe-Walker)

Research Areas

Biochemical studies of marine organisms
(L. Cruz, G. Concepcion)

Natural products in seaweeds and invertebrates
(N. Montaño)

Population genetics of marine organisms
(P. Aliño, A. Juinio-Meñez)

Major Projects on Oceanography

1. PACIFIC SEABOARD RESEARCH and DEVELOPMENT PROGRAM

Components:

Project 1: Assessment of Reef Resources in Eastern Philippines.

Project 2: Oceanographic Studies on the Mindanao Eddy, the North Equatorial Current (NEC) bifurcation and fluxes into Archipelagic Seas.

Project 3: An Oceanographic Survey of Philippine Archipelagic Waters in Central Philippines.

Project 4: Lianga Bay Integrated Coastal Management Program

PACIFIC SEABOARD R and D PROGRAM

Philippine Council for Aquatic and Marine Research and Development
Department of Science and Technology
Los Baños, Laguna

Project 2: Oceanographic Studies on the Mindanao Eddy, the North Equatorial Current (NEC) bifurcation and fluxes into Archipelagic Seas.

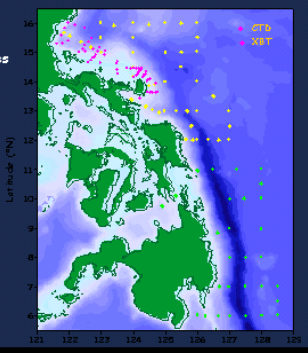
Bureau of Fisheries and Aquatic Resources
Department of Agriculture
Quezon Avenue, Quezon City

Cruise Track

ACTIVITIES

Three oceanographic cruises
- Cruise 1 Apr. 8-19, 2000
- Cruise 2 Jul. 27-Aug. 7, 2000
- Cruise 3 Apr.1-11, 2001

DATA COLLECTED
- Temperature
- Salinity
- Dissolved Oxygen
- pH
- PAR
- Chlorophyll a
- Transmissivity
- Nutrients (PO_4, NO_2, NO_3, SiO_4)
- Zooplankton Biomass
- Zooplankton Composition
- Ichthyoplankton (Cruise 3)



M.V. DA-BFAR

Length overall ---------- 60.00m
Gross tonnage ---------- 1156 GT

UP-MSI Scientific Personnel

Parameters collected:

From CTD sensors (0-1500m)
- *temperature, salinity/conductivity, DO, PAR and pH*

From Expendable Bathythermographs
- *temperature profile*

From collected water samples
-DO, pH, alkalinity, chlorophyll concentration and nutrients (nitrite, nitrate, phosphate, silicate).

From NuShuttle (0-150m)
-temperature, salinity/conductivity, chlorophyll, transmissivity and PAR

From Plankton tows (0-100m)
- phytoplankton comp., bacterial cell counts, zooplankton biomas and composition

Handheld spectroradiometer
-upwelling and downwelling irradiance spectra

Onboard productivity experiments
- phytoplankton production rates

LICOR light meter
- subsurface irradiance measurement

Other Projects of UP-MSI

- RP-Vietnam Joint Oceanographic Marine Scientific Research Expedition(JOMSRE)

JOMSRE I (1997)
JOMSRE II (2000)

- part of the joint agreement between the Philippine Government and the Government of Vietnam

•Influence of the South China Sea on the Philippine Shelf Reef Systems

Philippine Council for Aquatic and Marine Research and Development
Department of Science and Technology
Los Baños, Laguna

Project A: Biodiversity of Reef Associated Organisms.

Project B: Recruitment

Project C: Marine Information System (MIDAS)
•holdings of all databases and catalog of data collected by institutions under College of Science.

•Establishment of a Marine Science Research Program at the Kalayaan Islands, Philippines

Philippine Council for Aquatic and Marine Research and Development
Department of Science and Technology
Los Baños, Laguna

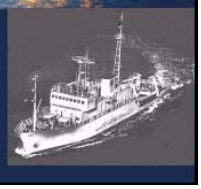
Research vessels used by UP-Marine Science Institute in conducting oceanographic research

•M/V DA-BFAR (DA-BFAR)

- a fisheries management, training, research and oceanographic vessel

•RPS Explorer (MGB)

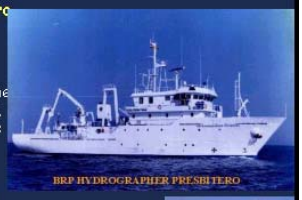
- an offshore mineral exploration vessel



(http://www.arcoast.org/rv/index.htm)

•BRP Hydrographer Presbitero (NAMRIA)

- a multi-purpose vessel specially designed for carrying out submarine topographic and geological surveys, various oceanographic observations and pollution monitoring.



•Ventura (NAMRIA)

- the twin-ship of brp hydrographer presbitero

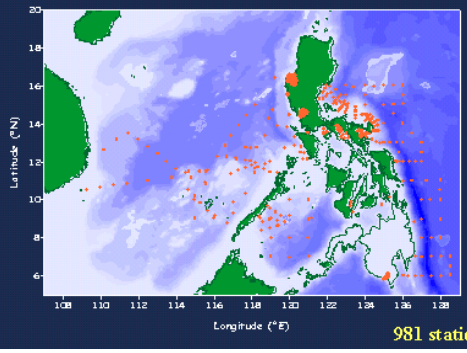
•TRV Sardinella (UPV)

- a fisheries training vessel

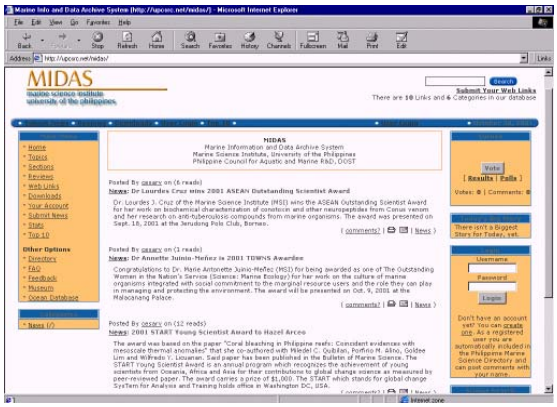
Database

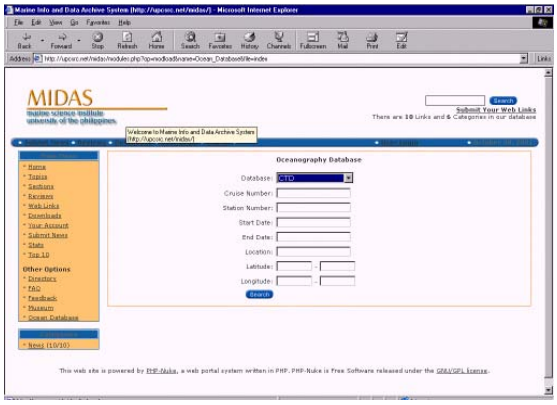
•Hardware Component
  •PC Cluster
•Software
  •MySQL (Standard Query Language)
•Access:
  •Web Interface written using PHP

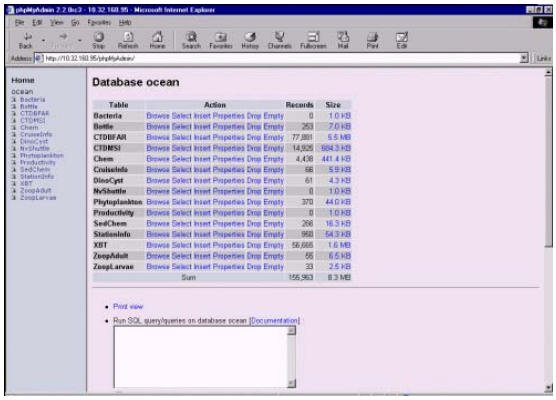
Current Data Holdings

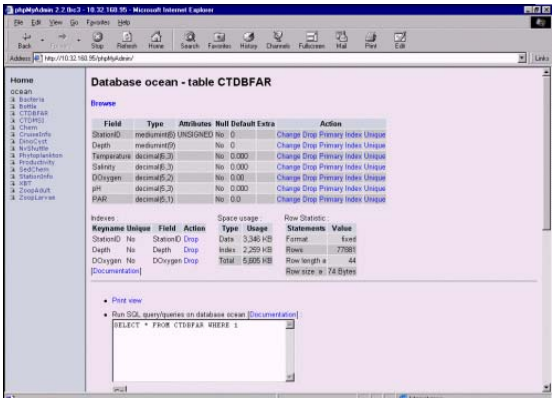


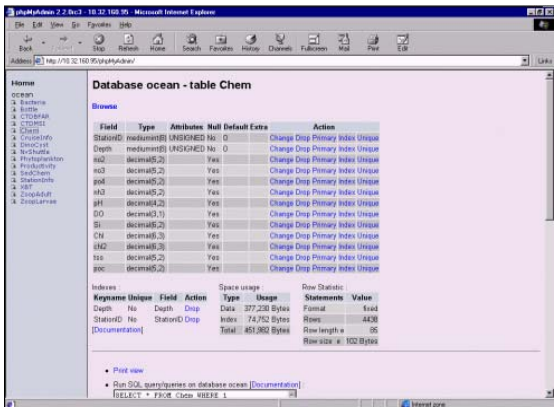
981 stations

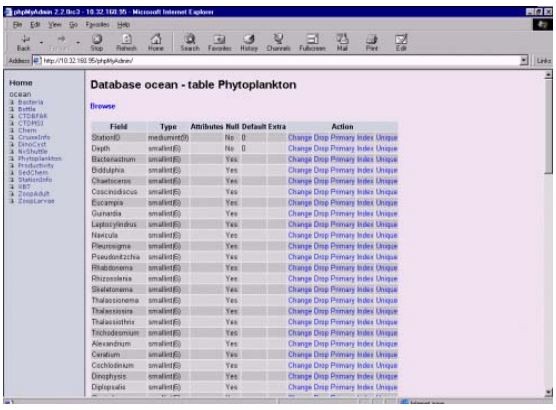

MIDAS
Marine Information and Data Archive System
Marine Science Institute, University of the Philippines
Philippine Council for Aquatic and Marine R&D, DOST

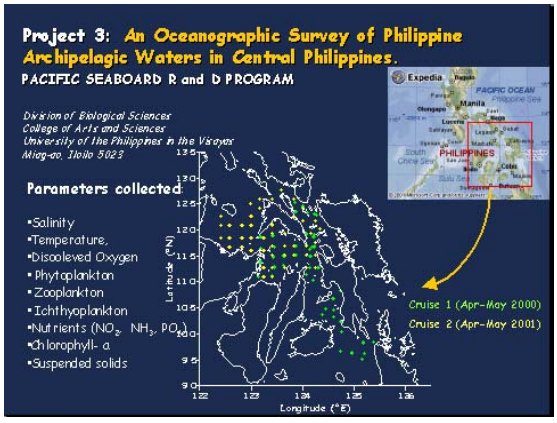

MIDAS
Oceanography Database

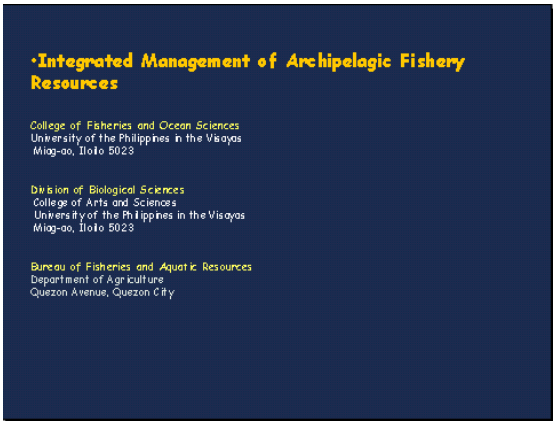

Database ocean


Database ocean - table CTDBFAR


Database ocean - table Chem


Database ocean - table Phytoplankton


Project 3: An Oceanographic Survey of Philippine Archipelagic Waters in Central Philippines.
PACIFIC SEABOARD R and D PROGRAM
Division of Biological Sciences
College of Arts and Sciences
University of the Philippines in the Visayas
Miag-ao, Iloilo 5023
Parameters collected
•Salinity
•Temperature,
•Dissolved Oxygen
• Phytoplankton
• Zooplankton
• Ichthyoplankton
•Nutrients (NO_2, NH_3, PO_4)
•Chlorophyll- a
•Suspended solids
Cruise 1 (Apr-May 2000)
Cruise 2 (Apr-May 2001)
Latitude (°N)
Longitude (°E)


•Integrated Management of Archipelagic Fishery Resources
College of Fisheries and Ocean Sciences
University of the Philippines in the Visayas
Miag-ao, Iloilo 5023
Division of Biological Sciences
College of Arts and Sciences
University of the Philippines in the Visayas
Miag-ao, Iloilo 5023
Bureau of Fisheries and Aquatic Resources
Department of Agriculture
Quezon Avenue, Quezon City

National Mapping and Resource Information (NAMRIA)

- central mapping and resource information agency of the government.
- mandated national oceanographic center of the Philippines.
-provides geographic and resource information through:

- surveying

geodetic and geophysical surveys
magnetic surveys
gravimetric surveys
oceanographic survey
hydrographic surveys
topographic surveys

- remote sensing and mapping

Remote Sensing Center - analysis, interpretation, and processing of satellite data

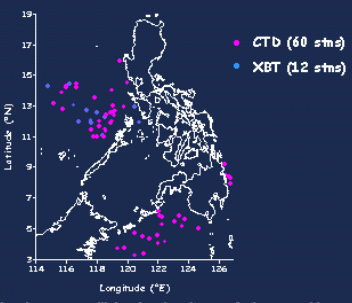
- land classification and evaluation
- information management and dissemination

Two hydrographic vessels :

- map the nation's marine territory and produce nautical charts.
- Hydrographic and Oceanographic survey of Exclusive Economic Zone(EEZ) of the Philippines (1999-2004).

- to provide information necessary for delineation of the territorial water and EEZ under the UN Convention on the Law of the Sea

Current Data Holdings



*most of the data are still in the database of the two ships.

NAMRIA has in its holdings several types of satellite imageries such as:

- Landsat TM
- SPOT
- MOS1
- NOAA AVHRR
- SAR data.

UP-Marine Science Institute (UP-MSI) - local-funded project involves the use of ocean colour in capture fisheries.

- identify areas of high planktonic productivity in the country's territorial and Exclusive Economic Zone (EEZ) waters
- identify and evaluate critical areas for fishery enhancement and management.

Ocean and Littoral Affairs Group(OLAG)

- handles the hydrographic and oceanographic requirements of the Philippine Navy.
- provides comprehensive hydrographic and oceanographic data in the form of Special Tactical Oceanographic Charts (STOIC) to end users in the Fleet and the Marines.

STOIC - actual navigational chart (3 ft x 8 ft) that summarizes oceanographic and hydrographic data for a particular area of operation.

Contents:

- photos of the beach
- description of coastal features
- bottom composition
- beach slopes and gradients
- surf zone information
- underwater visibility
- bioluminescence
- fishing methods
- shipping
- pollution
- dangerous marine life
- marine vegetation
- trafficability of beaches
- surface current
- temperature
- salinity
- density
- sound speed profile
- tidal profile of a specific area

OLAG has two units under it:

1. Seaborne unit - in charge of all the floating assets
2. Naval Oceanographic and Meteorological Unit (NOMU)- handles the survey, processing of data, and final distribution of product

Past projects includes
- STOIC of Ternate and Canacao Bay Cavite,
- Base Map of Inagawan Palawan
- Hydrographic survey of Puerto Princesa Palawan.

Continuing Activities
- Annual Aerial Acoustic and Oceanographic Survey of Northern Philippines
- Hydro Survey of the naval training exercise areas.

Future projects include
- hydro survey of the western Palawan side and selected areas in Mindanao.

E-THAILAND

Country Report

Komsan Klinsukon
Physical Oceanographic Section, Hydrographic Department
Royal Thai Navy

Importance of seas and adjacent rivers have been recognized by people of most past of the world for millenium. People of Thailand rely on them since the very beginning of the establishment of the Kingdoms centuries ago. The rivers and canals were used as major routes for transportation while seaways were essentially important for commercial with China, India, Japan etc. Even in the very recently, transport via seaways is still the most efficient mean and it will be so for a foreseeable future.

Sea of Thailand is over three hundred thousand square kilometers with 2800 kilometers - long coastline, both in Gulf of Thailand and Andaman Sea. Located several seaports, fishery communities, aquaculture facilities, and industrial areas around the shoreline, nearshore processes are one of the most important area of interest recently. The sea is also the primary source of marine resources and the major transport system; as a result, understanding the characteristic of the system is crucial for oceanographic communities. Oceanographic data observations and analysis are essential for many areas of study such as coastal engineering, fishery and marine environment. Hydrographic Department is one of the agencies playing the leading role in order to collect and contribute oceanographic data to other marine communities both in Thailand and abroad.

Oceanographic Data Collection in Thailand

Oceanographic survey in Thailand began with nearshore observation just after the WWII. The cruises were carried out by the Royal Thai Navy ships that were not specially designed for oceanographic survey. However, Hydrographic Department still carried out 39 surveys, 38 in Gulf of Thailand and 1 in Andaman Sea. After two new vessels, the H.D. 1 and the H.D. 2, became commission and jointed later with the 1500-ton HTMS Suk in 1982, further 45 more observation, 41 in Gulf of Thailand and 5 in Andaman Sea, were carried out. Today, supplement by a cruise in Andaman Sea in some year, one oceanographic cruise in Gulf of Thailand is caring out annually. For each cruise, temperature, salinity, conductivity, DO, pH, sediment data, current, and meteorological data are collected.

As the oceanographic data increase dramatically, especially after 1994 when CTD and XBT data became available, Hydrographic Department started to collect data in digital form. Another oceanographic data is tidal height which began in 1904 at Bangkok Bar, located at the mouth of the Cho Praya River. By April 1911, the first tide datum was calculated. The subsequence 5-year water level form Ko Lak station was averaged and known as standard mean sea level of Thailand in October 1915. The Ko Lak 1915 datum is still used as standard mean sea level of Thailand at though later studies showed that this is not truly the long term average.

After 1911, as Hydrographic Department operated more and more tide gauge, tidal observations became its responsibility. More tidal data is also acquired from other authorities such as Port Authority of Thailand and Harbor Department, who still operates bulge portion of tide gauges in Thai water. Then, hourly heights have been published for all station. Out of all 27 stations, only 11stations belong to the Hydrographic Department. The Port Authority of Thailand operates others 4 and further 12 stations are run by the Harbor Department.

Coastal marine processes are one of the most interested areas of study recently. In order to understanding better the coastal and nearshore processes, data such as nearshore sediment, current, wave data, bottom topography, beach profile are utmost important. Hydrographic Department also has responsibilities in many beach and nearshore work including shore erosion protection, coastal construction, and environment impact assessment study. In the later roles, further data such as nutrient and heavy metal might be collected.

Oceanographic Data Management

Initially, all of oceanographic data were not well organized due to lack of manpower and experience. Most of them were hard copy and paper reports, which were not easy to reproduce, exchanged, and updated. As the data increase dramatically, Hydrographic Department face the inevitable problem: how to access data swiftly; how to maintain data consistency; how to give data in proper form for user; and how to exchange data effectively. To meet these demands, planing for the oceanographic data center is undertaken by the Oceanographic Division, Hydrographic Department in 1997. The Oceanographic Division has initiated the oceanographic database as the first and most important step toward its objective. The oceanographic data center will has many responsibilities include:

to collect oceanographic data form contributors
to develop quality control procedures
to archive data in proper format
to update data and maintain data consistency
to contribute data in standard format and as requirement
to develop on-line data and information exchange system

On-Going Activities

With larger platform together with better instrument make systematically data management became more essential in order to access data, covert data to information, and deliver them to users efficiently. Oceanographic database is the most important tool for making effective and efficient data management procedure; therefore, it is the first essential step to convert existing data to proper form. Oceanographic Division is working on make data and information available in digital formats that are convenient for users to access.

The existing data, regardless their form, has been digitized. This essential procedure is very time consuming due to large amount of data and information involve. Moreover as mention early, Hydrographic Department has many responsibilities and underpersonal; therefore, there is still a lot of data left to be digitized. This procedure will not be carried out in a couple of years.

Then, the digitized data are rechecked and archived in database built around Access Database, which is used as data entry and a data management tool on personal computers. Until now, only hourly tidal height and 25-hour current observation have been checked and achieved while the others are partially digitized.

Future Work

After finishing database, on-line directory of oceanographic data will be built. This directory which provides users the knowledge of what data they can acquire from the database, will be shared by other agencies. The next important challenge has to be overcome is how to convert data to information convenient for users who need it in numerous forms which this training will be most helpful for us to solved this problem.

F-VIETNAM

The Main Activities of Oceanographic Data Center of Institute of Oceanography

Vu Van Tac
Oceanographic Data Center
Institute of oceanography, Nha Trang,

ABSTRACT

The paper gives a short introduction about the main activities and products of Oceanographic Data Center of Institute of Oceanography, Nha Trang, Vietnam.

INTRODUCTION

Oceanographic Data Center *(ODC)* is one of departments of Institute of Oceanography. It was established in 1996. Its first task was to realize the national project KHCN-06.01 on establishment of the Vietnam Oceanographic Data Bank, in order to collect and manage data from various marine research institutes and organizations concerned in Vietnam. This was the first step toward official establishment of Vietnam Oceanographic Data Center*(VODC)*.

In the period of 1996-2000, ODC designed and built the *VODC software package* for integrated oceanographic data management, and established the Oceanographic Database of the South China Sea and adjacent waters. In addition, ODC has also designed and built some softwares for the calculation of tide, current and wind in the estuarine areas.

Some results of ODC activities are given below:

- **VODC SOFTWARE PACKAGE**

This software package consists of 03 following softwares:

1. VODC for PC

VODC for PC is the software for Integrated Oceanographic Data Management designed for personal computer with 32-bit operating system. The database management system is on Microsoft Access 97. It was carried out and finished in 1997.

Nowadays, VODC for PC has been used to store and manage data in many Vietnamese marine research Agencies. During a long time of using, it is proved that VODC for PC is easy to use, fast to manipulate and preserve data in synthetic manner. Especially, it can exchange data with some other popular softwares.

2. VODC for NT

This software was carried out and finished in 1998, designed with the same functions as VODC for PC, but it worked in Client/Server model on local network with network operating system such as, Win NT Server, Novell, NetWare....etc, and the database management system was Microsoft SQL Server. VODC for NT enables to convert a database file from VODC for PC format into VODC for NT format or, conversely, from VODC for NT format into VODC for PC format. In addition, it also provides many crucial functions for data accessing as well as data exchanging.

Nowadays, VODC for Network has been used in ODC to create a united marine database.

3. VODC Home Page

VODC Home Page was carried out and finished in 1999, designed in order to provide users to access data from VODC Database through Internet.

VODC Home Page's Address is "http://www.KHCN0601"

The working model of VODC Home Page on Internet is showed in figure 01.

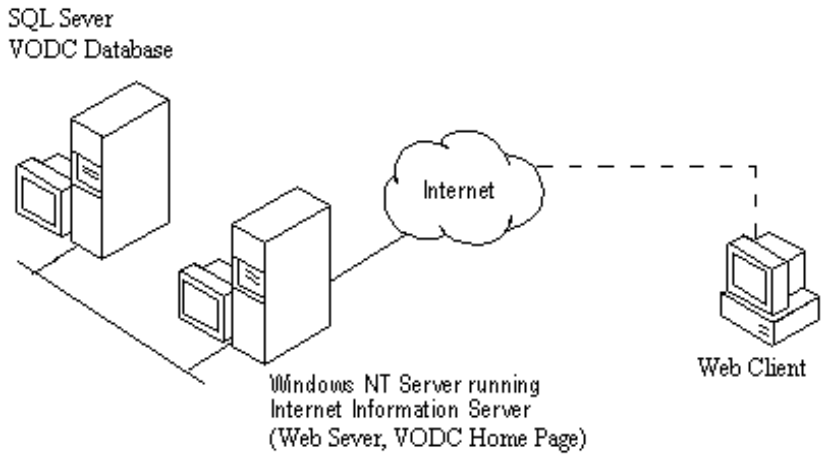


Figure.01: The working model of VODC Home Page on Internet.

VODC Home Page had been successfully published for testing on the Internet for the last three months of 1999.

- **VODC DATABASE**

VODC Database is the main result of the KHCN-06.01 project, the oceanographic database of the South China Sea and adjacent waters. The data sources of the VODC database were derived from most marine research institutes in Vietnam and some overseas oceanographic data centers such as, World Data Center-A (WDC-A), World Data Center-B (WDC-B), Ocean Climate Laboratory US National Oceanographic Data Center (OCL-NODC) and Japan Oceanographic Data Center(JODC).

The available type and volume of data in the *VODC Database* are presented in Table 1.

The *VODC database* can be considered as the initial oceanographic database to lay the foundation of official establishment of the Vietnam Oceanographic Data Center. For some data types such as, in the field of hydrology, hydrochemistry and hydrodynamics, the volume of data is big enough to serve many requirements of exploitation, protection and investigation of the sea. In near future we hope that the database will be updated with data from other domestic and foreign oceanographic data sources.

- **SOUTH CHINA SEA ATLAS**

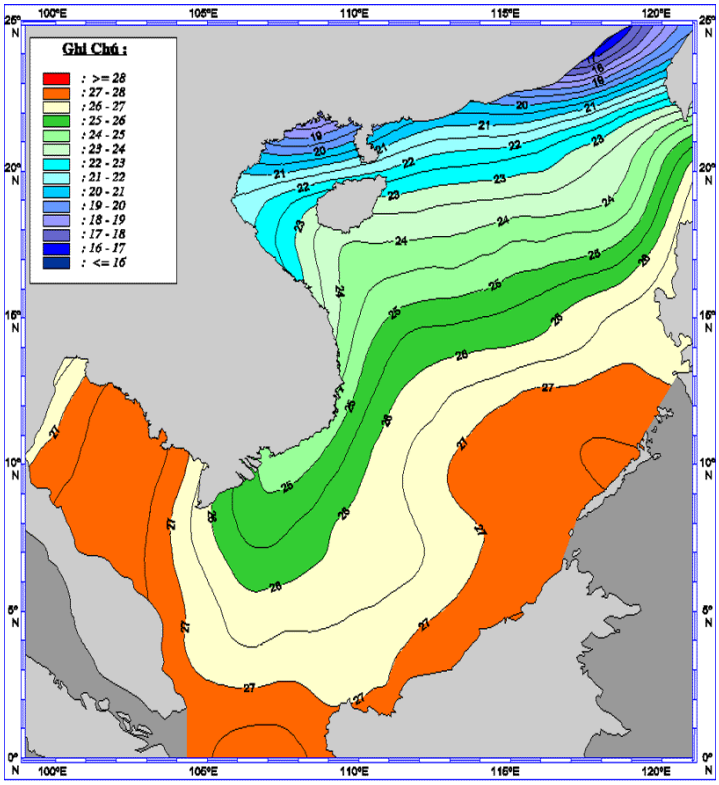
The South China Sea Atlas is the Web CD-Rom, the last product of ODC. There are more than two thousands maps in this CD, which describes the distributions of temperature, salinity, density and stations according to time and depth in South China Sea and adjacent waters limited by the longitudes 99^0E and 125^0E, and the latitudes 5^0S and 25^0N. VODC Database was the main data source, which was used to make the maps. The figure 2, 3 and 4 are the illustrations of the maps.

- **CONCLUSION**

Even though ODC has been established for fewer than five years, it has constructed some significant progresses. However, we know that it will take many difficulties to reach the real developed and useful data center. Consequently, we really want to co-operate with the overseas marine data centers to get new-technologies as well as exchange experiences on marine data management.

Table 1: The type and volume of the oceanographic data of the South China Sea and adjacent waters are available in the VODC Database

Data type	No. of serial stations	No. of time series	No. of observations	Period of observation
HYDROLOGY& HYDROCHEMISTRY				
Temperature	119,628	242	3,380,954	1888-1999
Salinity	29,516	64	524,218	1907-1999
Oxygen	13,209		267,048	1929-1998
Phosphate	7,632		55,775	1929-1998
P_{total}	781		1,583	1991-1998
Nitrate	3,929		26,802	1929-1998
Nitrite	3,704		24,559	1929-1998
N_{total}	810		1,783	1991-1998
Silicate	4,940		35,781	1947-1998
Alkalinity	893		6,465	1961-1998
PH	7,483		49,109	1929-1998
MARINE HYDRO – DYNAMICS				
Surface current	94,514		94,514	1900-1998
Current meters		620	171,965	1980-1998
Sea level		284	209,587	1990-1998
Wave	2,147	122	22,077	1976-1998
MARINE METEOROLOGY				
Air pressure	673	190	23,045	1970-1998
Wind	680	241	33,253	1970-1998
Cloud	529		1,053	1970-1998
Air temperature	440	241	34,009	1970-1998
Humidity	1,053	242	29,183	1970-1998
Rainfall	894	192	261	1970-1998
Water colour	261		4,476	1970-1998
Water transparency	2,246		2,246	1970-1998
GEOLOGY & GEOPHYSICS				
Geochemistry of sediment	5,926(samples)		118,520	1976-1998
Gravity	4,046		4,046	1990
Magnetics	10,098		10,098	1990
Bathymetry	2,006		2,006	1990
MARINE BIOLOGY				
Primary productivity	628		1,146	1983-1988
Chlorophyll-a	1,894		3,467	1961-1988
Phytoplankton	1,045		4,762	1960-1988
Zooplankton	2,451		26,545	1960-1988
Fish eggs/larvae	2,553		10,097	1960-1988
Phytobenthos	669		790	1990-1998
Zoobenthos	1,424		10,565	1960-1988
MARINE POLLUTION				
Suspended matter	1,471		3,162	1996-1998
Trace metals	910		5,628	1996-1998
Pesticide residues	45		360	1996-1998
Petroleum residues	333		333	1996-1998
Other contaminant			2,959	1996-1998



Nhiệt độ trung bình tháng 1 (˚C), tầng mặt

Figure 2: The distribution of mean temperature (^{0}C) in January, At depth=0 m

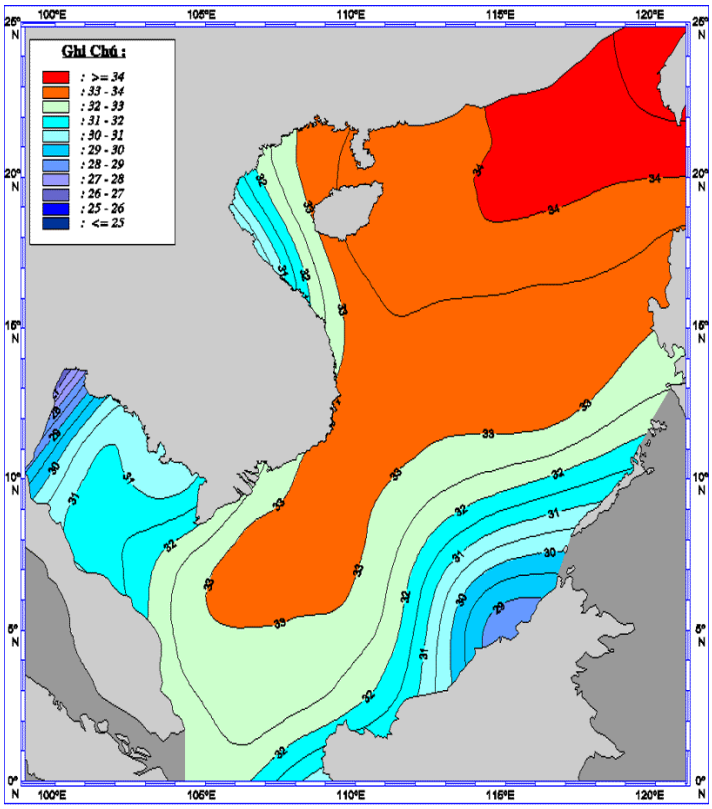
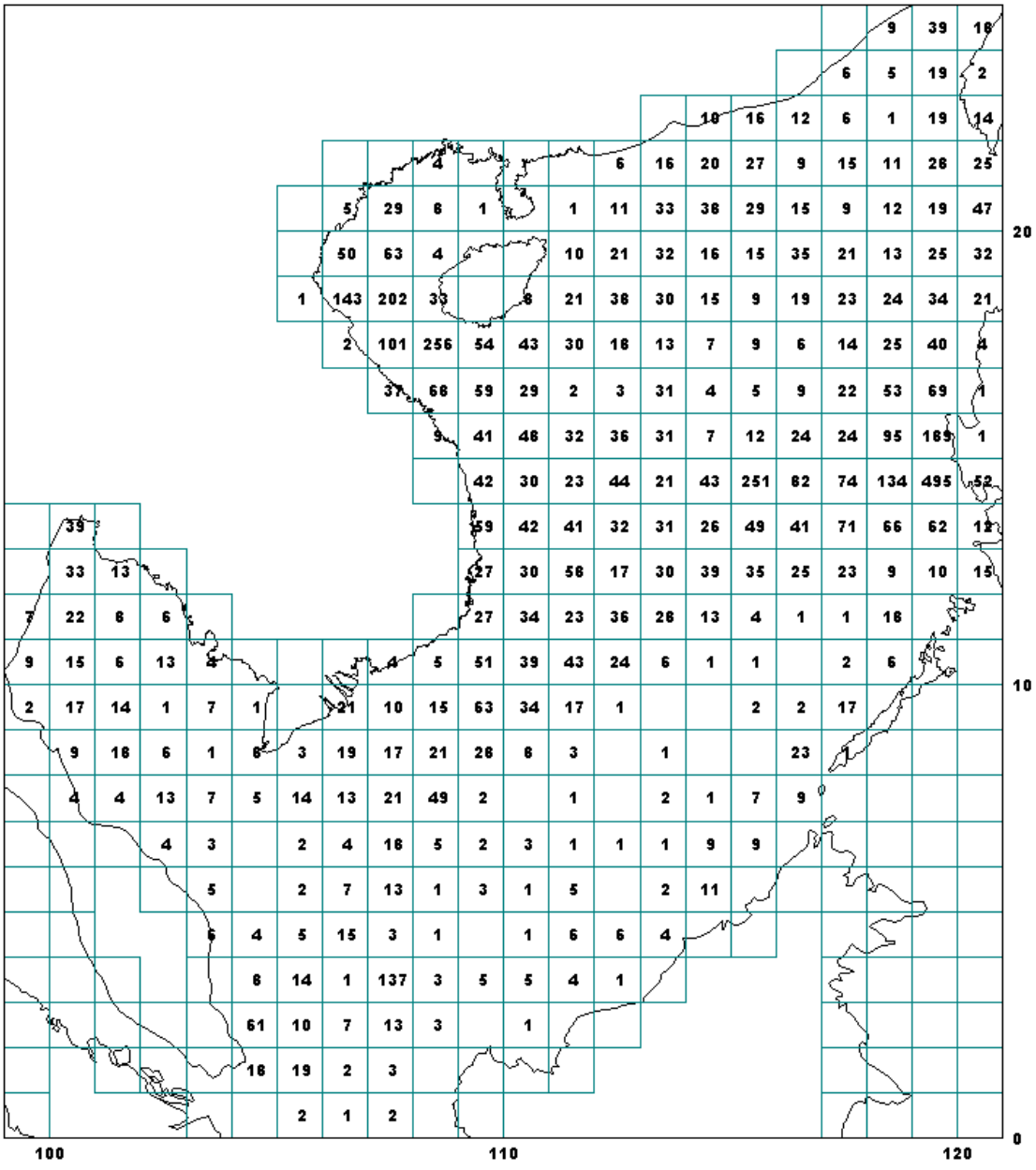


Figure 3: The distribution of mean salinity ($^0/_{00}$) in November,



Phân bố số liệu nhiệt độ, tầng 0m

Chu kỳ : tháng 1

Figure 4: The distribution of temperature stations in January
At depth = 0 m

● ACKNOWLEDGEMENT

The author would like to express sincere thank to the leaders of KHCN-06.01 project Professor Vo Van Lanh and informatics engineer Phan Quang for their significant contribution to the success of this paper.

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ANNEX IV

LIST OF PARTICIPATING COUNTRIES IN TRAINING COURSE FROM 1982 TO 2001

(WESTPAC Data Management)					
1st	:	9 Mar.	-	9 Apr. 1982	Republic of Korea, Philippines, Thailand
2nd	:	16 May.	-	28 May. 1983	China, Republic of Korea, Vietnam
3rd	:	4 Jun.	-	16 Jun. 1984	China, Republic of Korea, Vietnam
4th	:	2 Sept.	-	14 Sept. 1985	China, Philippines, Vietnam
5th	:	8 Sept.	-	20 Sept. 1986	China, Republic of Korea, DPR of Korea, Malaysia (2), Thailand
6th	:	7 Sept.	-	19 Sept. 1987	China, Philippines, Thailand
7th	:	26 Sept.	-	8 Oct. 1988	Republic of Korea, Thailand, Vietnam
8th	:	25 Sept.	-	7 Oct. 1989	China, Indonesia, Malaysia, Thailand, Republic of Korea
9th	:	15 Oct.	-	26 Oct. 1990	Indonesia, Republic of Korea, Vietnam
10th	:	24 Sept.	-	9 Oct. 1991	Republic of Korea, Vietnam, Philippines, Thailand (2)
11th	:	28 Sept.	-	9 Oct. 1992	Indonesia, Philippines, Thailand
12th	:	27 Sept.	-	8 Oct. 1993	Indonesia, Thailand, Vietnam
13th	:	26 Sept.	-	7 Oct. 1994	Malaysia, Philippines, Vietnam
14th	:	6 Oct.	-	27 Oct. 1995	China, Indonesia, Republic of Korea (5)
15th	:	14 Oct.	-	25 Oct. 1996	Philippines, Thailand
(WESTPAC/NEAR-GOOS Data Management)					
1st (16th)	:	13 Oct.	-	24 Oct. 1997	Republic of Korea (5), Russia, Vietnam
2nd (17th)	:	12 Oct.	-	23 Oct. 1998	China (2), Republic of Korea (2), Malaysia, Russia
3rd (18th)	:	24 Jan.	-	4 Feb. 2000	China • Indonesia • Republic of Korea • Russia • Vietnam
4th (19th)	:	27 Nov.	-	8 Dec. 2000	China • Indonesia • Republic of Korea, Malaysia • Russia
5th (20th)	:	5 Nov.	-	16 Dec. 2001	China • Republic of Korea, Philippines, Thailand • Russia, Vietnam

ANNEX V

LIST OF ACRONYMS

ADCP	Acoustic Doppler Current Profiler
AXBT	Air launched Expendable Bathythermograph
CSR	Cruise Summary Report
CTD	Conductance Temperature Depth recorder
DMDB	Delayed Mode Data Base
ECDIS	Electronic Chart Display and Information System
ENC	Electronic Navigation Chart
GEBCO	General Bathymetric Chart of the Oceans
GODAR	Global Oceanographic Data Archaeology and Rescue Project
IGOSS	Integrated Global Ocean Services System programs
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange Programme
J-DOSS	JODC-Data Online Service System
JHD	Japan Hydrographic Department
JMA	Japan Meteorological Agency
JODC	Japan Oceanographic Data Centre
MARPOLMON	Marine Pollution Monitoring programme
MEDI	Marine Environmental Data Information Referral Catalogue
MGD	Marine Geophysical Data Format
MIRC	Marine Information Research Centre
NEAR-GOOS	North-East Asian Regional GOOS
NODC	National Oceanographic Data Centre
NOP	National Oceanographic Programme
NRIFS	National Research Institute of Fisheries Science
RNODC	Responsible National Oceanographic Data Centre
PARI	Port and AIRPORT Research Institute
RRTDB	Regional Real Time Data Base
RTDB	Real Time Data Base
TRITON	TRIangle Trans-Ocean Buoy Network
WESTPAC	IOC Sub-Commission for the Western Pacific
WDC	World Data Centre
WOCE	World Ocean Circulation Experiment
XBT	Expendable Bathythermograph