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**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
(of UNESCO)**

Third Session of the IOC Sub-Commission  
for the Western Pacific  
Tokyo, Japan, 26 February - 1 March 1996

**Draft Pilot Implementation Plan for  
North-East Asian Regional - Global Ocean Observing System  
(NEAR-GOOS)**

## EXECUTIVE SUMMARY REPORT ON

### Expanded ad hoc Working Group Meeting for the NEAR-GOOS Implementation Plan

IOC Regional Secretariat for WESTPAC  
Bangkok, Thailand, 8-10 January 1996

#### 1 INTRODUCTION

The Expanded ad hoc Working Group Meeting for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS) was held in the IOC Regional Secretariat for WESTPAC, Bangkok, Thailand, 8-10 January 1996, with generous support from National Research Council of Thailand (NRCT).

The Chairman of the ad hoc Working Group for NEAR-GOOS Implementation Plan, Dr. Keisuke Taira chaired the meeting. He invited Prof. Su Jilan, the Chairman of the IOC Sub-Commission for the Western Pacific (WESTPAC), and Prof. Manuwadi Hungspreugs, the Vice-Chairwoman of WESTPAC to address the meeting. Prof. Su and Prof. Manuwadi welcomed the participant and explained briefly the development of NEAR-GOOS.

Dr. Taira then introduced Dr. Suvit Vibulsresth, Secretary-General of NRCT. He welcomed all participants to Bangkok. The Secretary-General emphasized the importance of NEAR-GOOS as a demonstration case on regional approach for the Global Ocean Observing System. He indicated that the similar system has been developed in Thailand, the SEAWATCH THAILAND and expressed willingness to share experiences with scientists in the region.

Dr. Taira introduced the Provisional Agenda of the meeting, and which was adopted as the Agenda of the meeting with minor modifications, as shown in Annex I. The List of Participants is attached as Annex II. The meeting designated Dr. Dong Yong Lee to serve as Rapporteur of the meeting.

#### 2 Main Points of the Meeting

Dr. Taira reviewed briefly the NEAR-GOOS development and the outline of the Draft Implementation Plan prepared by the ad hoc Working Group, with reference to the resolutions adopted by the UNESCO General Conference at its 27th and 28th Session. He indicated that after discussion and revision of the plan, the document will be submitted to the Third Session of the IOC Sub-Commission for WESTPAC, Tokyo, Japan, 26 February - 1 March 1996 for approval

(i) The meeting reviewed the draft Implementation Plan, with appreciation to Dr. Taira and members of the Working Group for their hard working, and decided that the emphasis of the document should be the provision of general description of the project, to better reflect objectives and scientific implication of the NEAR-GOOS project, as an pilot implementation of Global Ocean Observing System (GOOS) in the regional level.

(ii) The meeting felt that the products and services which will be provided by the NEAR-GOOS to various users need to be further specified to ensure the success of the project. The meeting discussed and proposed what will be needed for an operational ocean service and application, and included the list in the revised Implementation Plan.

(iii) Recognizing the importance of the data collection, transmission and exchange on real-time and near-real-time of the project, the meeting agreed to the suggestions on establish a real-time data base and delayed mode data base for the project. The details is described in the Implementation Plan.

The meeting discussed the proposals provided by Japan Meteorological Agency (JMA) and Japan Oceanographic Data Centre (JODC) on management of the real-time and delayed mode data bases, and expressed sincere appreciation to JMA and JODC for their interests and efforts made available to the project. The meeting suggest that the real-time and delayed mode data base for the project be operated by JMA and JODC respectively.

(iv) The meeting agreed the principles proposed by the ad hoc Working Group for preparing the draft Implementation Plan with some modifications. The meeting discussed intensively the operational infrastructure for NEAR-GOOS and agreed to submit the proposal to the forthcoming Session of the WESTPAC Sub-Commission.

(v) The meeting agree on the revised version of the Pilot Implementation Plan on the North-East Asian Regional GOOS (NEAR-GOOS) as attached in the Annex III, and draft recommendation for the Third Session of WESTPAC.

(vi) The meeting encouraged all participating countries take necessary action to ensure the project be early implemented.

Dr. Taira expressed appreciation to all participants for their hard working and contribution and thanked the secretariat for the assistance provided to the meeting.

The meeting closed at 12:00 hours, on 10 January 1996.

## Annex I

# EXPANDED AD HOC MEETING FOR THE NEAR-GOOS IMPLEMENTATION PLAN

Bangkok, Thailand, 8-10 January 1996

## PROVISIONAL AGENDA

- 1 OPENING
  - 1.1 Opening Addresses
  - 1.2 Adoption of the Agenda
  - 1.3 Designation of Rapporteur
  - 1.4 Working Arrangement
- 2 STATUS OF NEAR-GOOS
  - 2.1 Review on Status Report of Implementation Plan  
*by Co-ordinator of the ad-hoc Group, Prof. Taira*
  - 2.2 Countries Reports
- 3 PLENARY SESSION ON GENERAL PART AND POLICY ISSUES
  - 3.1 Review on the General Part of the Draft Implementation Plan
  - 3.2 Review on the Policy Issues Part of the Draft Implementation Plan
- 4 PLENARY SESSIONS ON THE TECHNICAL PART
  - 4.1 Report Formats  
*GTS formats and NEAR-GOOS formats on temperature, salinity and current velocity*
  - 4.2a Design of Real-Time Data Base  
*access, report, management and operation manual*
  - 4.2b Design of Delayed/Continuous Data Base  
*access, report, management and operation manual*
- 5 PREPARATION OF DRAFT RESOLUTION FOR SC-WESTPAC-III
- 6 ADOPTION OF EXECUTIVE SUMMARY REPORT
- 7 CLOSURE

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## Annex III

### A PILOT IMPLEMENTATION PLAN FOR THE NORTH-EAST ASIAN REGIONAL GOOS (NEAR-GOOS)

#### 1. INTRODUCTION AND BACKGROUND

The continuous progress in oceanographic modeling and related meteorological forecasting, techniques of in-situ observations and telecommunications for them, and remote sensing technology observing ocean from space, makes now realistic to establish the Ocean Observing System which produces mapping and forecasting of oceanographic conditions in a similar way as meteorology has already achieved for various applications. Although many of ocean process is strongly influenced by the atmospheric forcing, its spatial scale is much smaller than that of atmospheric one. Thus, the system requires oceanographic data collected as frequently as meteorological observation with much fine spatial resolutions, and it is most feasible to be established first for semi-enclosed seas. The system contributes to ocean services in the region, management of coastal areas, climate prediction, management of marine living resources, and preserving health of the ocean, which coincide with ultimate goals of Global Ocean Observing System (GOOS).

The Intergovernmental Oceanographic Commission (IOC) has initiated the Global Ocean Observing System (GOOS) with co-operation with the World Meteorological Organization (WMO), the United Nations Environmental Programme (UNEP), and the International Council of Scientific Unions (ICSU). It is important to demonstrate the usefulness of the regional ocean observing system by establishing a pilot system with co-operation among countries in a proper region to be able to encourage such efforts for the rest of the world as a strategy of GOOS. The marginal seas in the North East Asian region have been chosen for such a regional GOOS pilot activity because of the available capabilities of the countries involved to develop and implement an operational activity, involving the collection and exchange of oceanographic data in real or near real-time.

At its 27th Session (Paris, November 1993), the General Conference of UNESCO adopted Resolution 57 which called on IOC to establish a GOOS regional pilot activity in the North-East Asian region. Pursuant to the Resolution, IOC organized in 1994 two expert meetings (in Beijing, 16-18 August, and Bali, 19-21 November) to define the framework for developing the project. As an outcome of these consultations, a draft proposal was prepared for an operational demonstration of certain aspects of GOOS activities: North-East Asian Regional GOOS (NEAR-GOOS).

The experts confirmed that the first step of the NEAR-GOOS should be the establishment of efficient data exchange of the existing observing systems in the region and then the present capabilities could be expanded as the system developed by improving the spatial and temporal resolution through international co-operation. In the course of the experts discussions, it was emphasized that the project should be officially endorsed by participating countries and that responsible organizations for the project within each participating country should be designated.

The proposal, after reviewed by the participants in the above-mentioned expert meetings, was submitted to I-GOOS Strategy Subcommittee on 27-30 March 1995 in Geneva to

report on the state of NEAR-GOOS. The parallel informal session on NEAR-GOOS suggested that the Ad-hoc group should be nominated by the WESTPAC Chairman to draft an implementation plan of NEAR-GOOS. The group consists of four experts: Y. Xu (China), K. Taira (Japan), D.-Y. Lee (Korea) and V.E. Ryabinin (Russia), and Dr. Taira is invited to be the leader of the group.

A draft of the implementation plan was discussed at informal meetings during I-GOOS-II and the Eighteenth Session of the IOC Assembly in June 1995. During these sessions, broad appreciation was shown for NEAR-GOOS as an effective means to implement the global GOOS concept at a regional level. The NEAR-GOOS Workshop had been held at Pusan, Korea in April 1995, in which various activities in the NEAR-GOOS region were reviewed. Another NEAR-GOOS Workshop was held at Matsue, Japan in November 1995, where the scientific goals of NEAR-GOOS and data service system were discussed.

Following the above, during its 28th Session (Paris, November 1995), the General Conference of UNESCO adopted Resolution 138 which calls on IOC to continue its effort to establish NEAR-GOOS with an eventual goal of WESTPAC-GOOS.

The Draft Proposal by the Ad-hoc group had been reviewed and revised by the Expanded Ad-hoc Meeting for the NEAR-GOOS Implementation Plan in Bangkok on 8-10 January 1996, and the present proposal is prepared.

## 2. GOALS OF NEAR-GOOS

### 2.1 Goals

The goals of the North-East Asian Regional GOOS (NEAR-GOOS) are to satisfy a number of specific applications:

- (i) to improve Ocean Services in the region,
- (ii) to provide data and information useful in the mitigation of the effects of natural disasters caused by waves, storm surges, and sea ice,
- (iii) to increase fisheries efficiency in their search for more productive fishing grounds,
- (iv) to provide information useful in pollution monitoring,
- (v) to monitor parameters useful to mariculture, particularly with regard to harmful algal blooms
- (vi) to provide information on the health of the coastal zone for recreation purposes,
- (vii) to provide data sets required for data assimilation, modeling and forecasting.

### 2.2 Scientific basis

The processes directly induced by atmospheric forcing, such as wind waves, storm surges, and wind-induced surface current can be modeled with provision of the proper atmospheric forcing. The prediction accuracy of the models relies on the improvement of estimation of the wind at ocean surface and the operational calibration of the models using the field data collected on a real time base.

Variations of temperature, salinity and current, and distribution of chemical substances in the regional seas have rather small scales in space and time. For instance the width of the Kuroshio, a major current in the sea area, is of a few tens of kilometers, and resolution of a few kilometer is necessary to describe the structure of the Kuroshio. Recent studies have revealed that variations of current and temperature have a dominant periodicity of 10 to 20 days. Bimonthly or

10-day mapping of temperature and current, presently made by several national agencies, gives seldom continuous time evolution of them. A daily mapping of oceanographic conditions is requisite.

Present technique of data assimilation can generate an uniform mapping even from limited numbers of in-situ data by making full use of remote sensing data from space. When the data assimilation is made from the daily data set, it may be the most useful for ocean service and for other applications.

Physical process in a semi-enclosed sea is governed not only the local forcing such as surface flux from atmosphere and mass flux from the rivers, but also by water exchange with outer regions. Recently the estimation of volume flux is able to be estimated from sea level difference, satellite measurement of altimeter, electric potential measurement by submarine cables, and other means at daily basis. Forecasting of oceanographic conditions is at hand, and it also need timely supply of in-situ data.

The long term observations are currently the only way to ascertain trends and low frequency variability of the ocean. There is therefore a crucial need that a robust and reliable data management system be put in place on a regional scale.

### **2.3 Objectives**

The initial objectives are to establish a real time data base and a delayed mode data base for NEAR-GOOS, which are operationally closely linked. The oceanographic data collected timely are to be reported by GTS (Global Telecommunication System, WMO), or directly by the electronic mail to NEAR GOOS Real Time data base. The whole data sets are to be transferred, on a periodic basis from the Real Time data base to be stored in the NEAR-GOOS Delayed Mode data base which are to be operated on the principle of IODE (International Ocean Data and Information Exchange, IOC). The two data bases are accessible by the participating countries and other countries through an electronic mail system.

## **3 APPROACH TO NEAR-GOOS**

### **3.1 Area of NEAR-GOOS**

The area of NEAR-GOOS is located in the North-East Asian region, which is a part of WESTPAC region, bounded by China, Republic of Korea, Democratic People's Republic of Korea and the Russian Federation along its western boundary and by the Russian Federation and Japan along the eastern boundary.

### **3.2 Principle**

a. The Participating Countries recognize the importance of regional co operation, in particular in the North-East Asian region, in ocean observing and research activities, more especially within the framework of the Global Ocean Observing System.

b. Each Participating Country shall designate responsible organizations to participate in NEAR-GOOS.

c. Each Participating Country shall endeavor to implement NEAR-GOOS, in co-operation with IOC and the other organizations co-sponsoring GOOS;

d. The Participating Countries shall co-operate with each other, bilateral or through multi-lateral international schemes, to promote the implementation of NEAR-GOOS;

e. The Participating Countries shall endeavor to promote human resource training activities within the WESTPAC region, with specific objectives that the covering area of the project and the number of the participating Countries should be expanded as well as the observational network improved;

f. The data obtained within the context of NEAR-GOOS shall be made available in the Data Bases, and shall be accessible to other countries within the framework of GOOS. To promote the exchange of the data between the regions within the framework of GOOS, the Participating Countries shall co operate with other regional activities related to GOOS. In conjunction with this point, the evaluation of the operation of NEAR-GOOS, shall be reported regularly to the governing bodies of IOC through I-GOOS and WESTPAC Sub-Commission;

g. All IOC, and particularly WESTPAC, Member States are encouraged to participate in NEAR-GOOS through the submission of data and use of the NEAR-GOOS data bases..

### 3.3 Data

The oceanographic data for NEAR-GOOS are temperature, salinity, currents, waves, sea level, dissolved oxygen, nutrients, and other Hydrographic elements.

The data for the NEAR-GOOS are of three different types: in-situ, remotely sensed, and derived from models. Collection of field data in real-time is very expensive and has a lot of risk. It also has limitation in space and time for the operational service, which can be overcome by means of in-directed method of data producing, such as remote sensing technologies and numerical modeling. They are complementary to each other and will enhance the operational capability.

The NEAR-GOOS region is one of the most densely and frequently surveyed areas as a result of long-term observations along the routine sections by research vessels for more than 50 years. The human activities in the region are high and the need for environmental monitoring is crucial.

Followings are lists of the ocean monitoring activities in the region:

(i) Routine (operational) data

Moored surface buoys, towers, coastal stations, and observation ships;

(ii) Supporting data

Drifting buoys, research programmes buoys, research vessels, and volunteer observation ships;

(iii) Remote sensing data

Satellite receiving centers are located at Hatoyama, Kumamoto, Kiyose, Sendai (Japan), Vladivostok (Russian Federation), Seoul, Pusan (Korea), Hangzhou, Tianjin and Beijing (China).

In NEAR-GOOS, data are to be transmitted through the GTS of WMO or email to NEAR-GOOS Real Time data base. The data from those sources will be stored in a bin on a daily basis for on-line access by the NEAR-GOOS users through an e-mail service or other direct access. The data in the bin will be kept for a certain period, most probably for 30 days. After that the stored data will be transferred in NEAR-GOOS Delayed Mode data base. Detailed oceanographic data, such as temperature and salinity at every 2 db from CTD casts, records of moored current meters, are submitted to the National Oceanographic Data Centers of IODE (International Ocean Data and Information Exchange, IOC) and eventually to NEAR-GOOS Delayed Mode data base together with data on chemical tracers such as dissolved oxygen, nutrients and others. The archived data are to be accessible by the users through an on-line access system.

Corresponding data flow is shown in Appendix 2.

Application of NEAR-GOOS may require not only oceanographic data but also marine meteorological data and others. The marine meteorological data can be collected through the GTS of the World Weather Watch (WWW). The meteorological data are also required for diagnostic models and for prediction models. For the modeling needs, the oceanographic community should depend on the meteorological community for the meteorological data, because one of the goals of the GOOS is to establish a WWW equivalent for oceanography.

#### 4 INITIAL PHASE

The operation of NEAR-GOOS will be implemented based on the basic project scheme and detailed Operational Manual prepared by Steering Committee of NEAR-GOOS, which will be formed after adoption of Draft Recommendation on the NEAR-GOOS Implementation Plan during the Third Session of the IOC Sub-Commission for WESTPAC from 26 February - 1 March 1996 in Tokyo.

It is recommended, in the initial phase, to start with basic oceanographic elements as temperature, salinity, current and wind waves to be reported at real time base. When the on-line data base is prepared, the reporters can become users not only of their own data but also of those data reported internationally each day. It is expected that a rapid increase of data reports will be achieved by the system. The products from the data should be prepared by the active users to match their own purposes. This must be a good demonstration of the capabilities of operational oceanography, which is the aim of NEAR-GOOS.

Outline of NEAR-GOOS Real Time data base and NEAR-GOOS Delayed Mode data base, proposed by Japan Meteorological Agency and Japan Ocean Data Center, respectively, is shown in Appendix 3.

#### 5 INFRASTRUCTURE

##### 5.1 NEAR-GOOS Co-ordinate Committee

Terms of Reference:

(i) Nature:

There is hereby, established, as management body of NEAR-GOOS, a Co-ordinate Committee for periodical review of the implementation of the overall system.

(ii) **Composition:**

The Committee shall consist of representatives of all Participating Countries. Each Country shall designate two members who should be able to monitor data flow to NEAR-GOOS Real Time data base and Delayed Mode data base. The Committee shall elect a Chairman and a Vice-Chairman among the members. The Chairman of the Co-ordinate Committee will serve as the NEAR-GOOS Co-ordinator. The committee shall meet in regular annual sessions. Other countries can attend the sessions as an observer.

(iii) **Function:**

The NEAR-GOOS Co-ordinate Committee shall:

- (a) preparing of Operation Manuals for the data bases;
- (b) review the situation of access and data reporting by the Participating Countries and others;
- (c) review the project area, specific variables, data standards and formats, to make necessary recommendations and to advise the Participating Countries;
- (d) review data and information infrastructure and allocation of observing platforms by the Participating Countries and advise on their improvements.

The committee recommends and reports to the Participating Countries and reports regularly to the IOC-Sub-Commission for WESTPAC.

The Co-ordinating Committee adopts an annual report of NEAR-GOOS for its distribution to the Participating Countries. This report shall be retained in the Data Base for reference by the registered users.

## **5.2 NEAR-GOOS Co-ordinator**

NEAR-GOOS Co-ordinator shall register the users of the NEAR-GOOS data bases along the application form.

## **5.3 Secretariat**

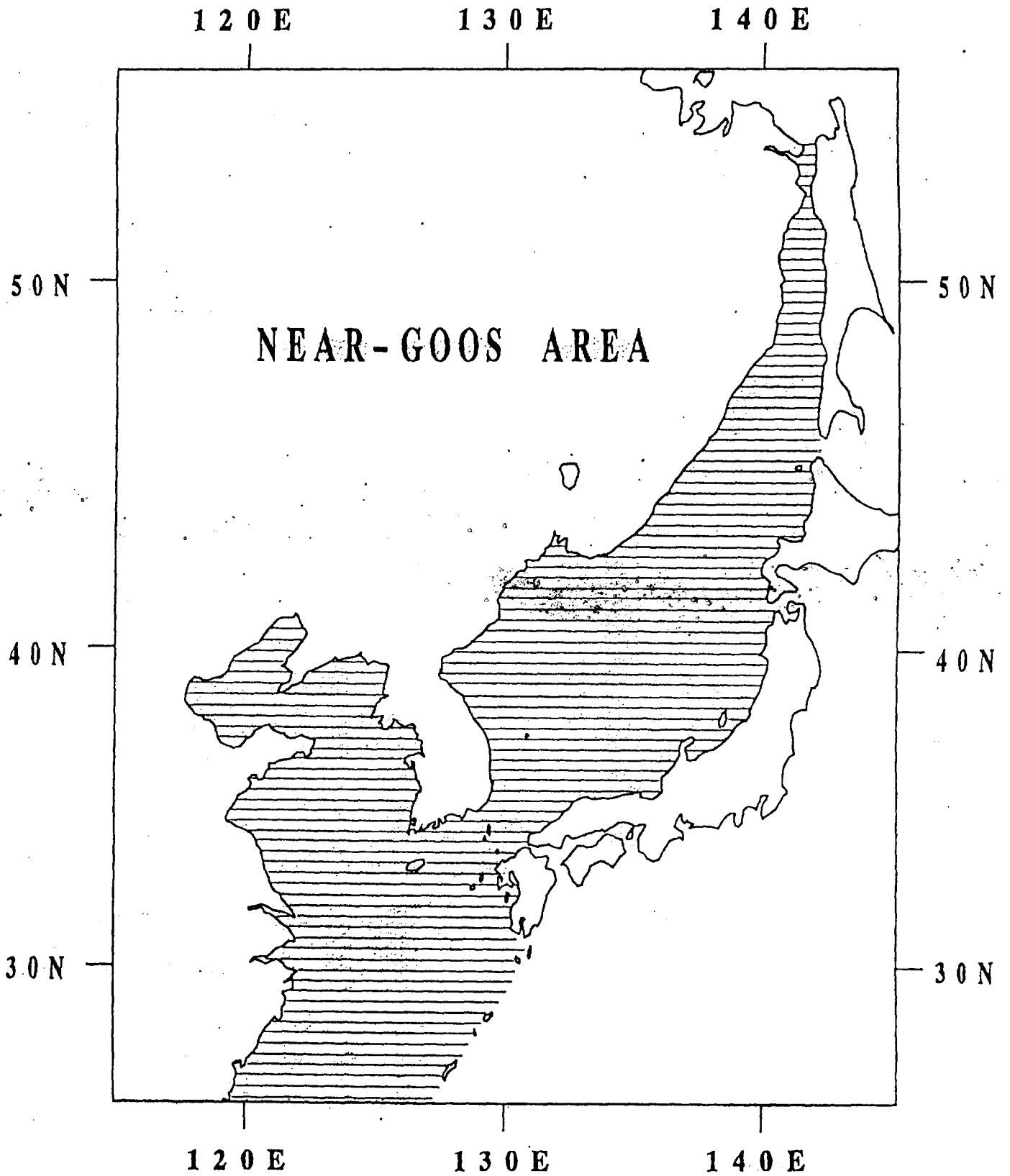
The IOC Regional Secretariat for WESTPAC shall provide service for the Committee.

## **5.4 Finance**

The Participating Countries and Users are responsible for financial implications of their access to Data Bases and their contribution to the NEAR-GOOS data report.

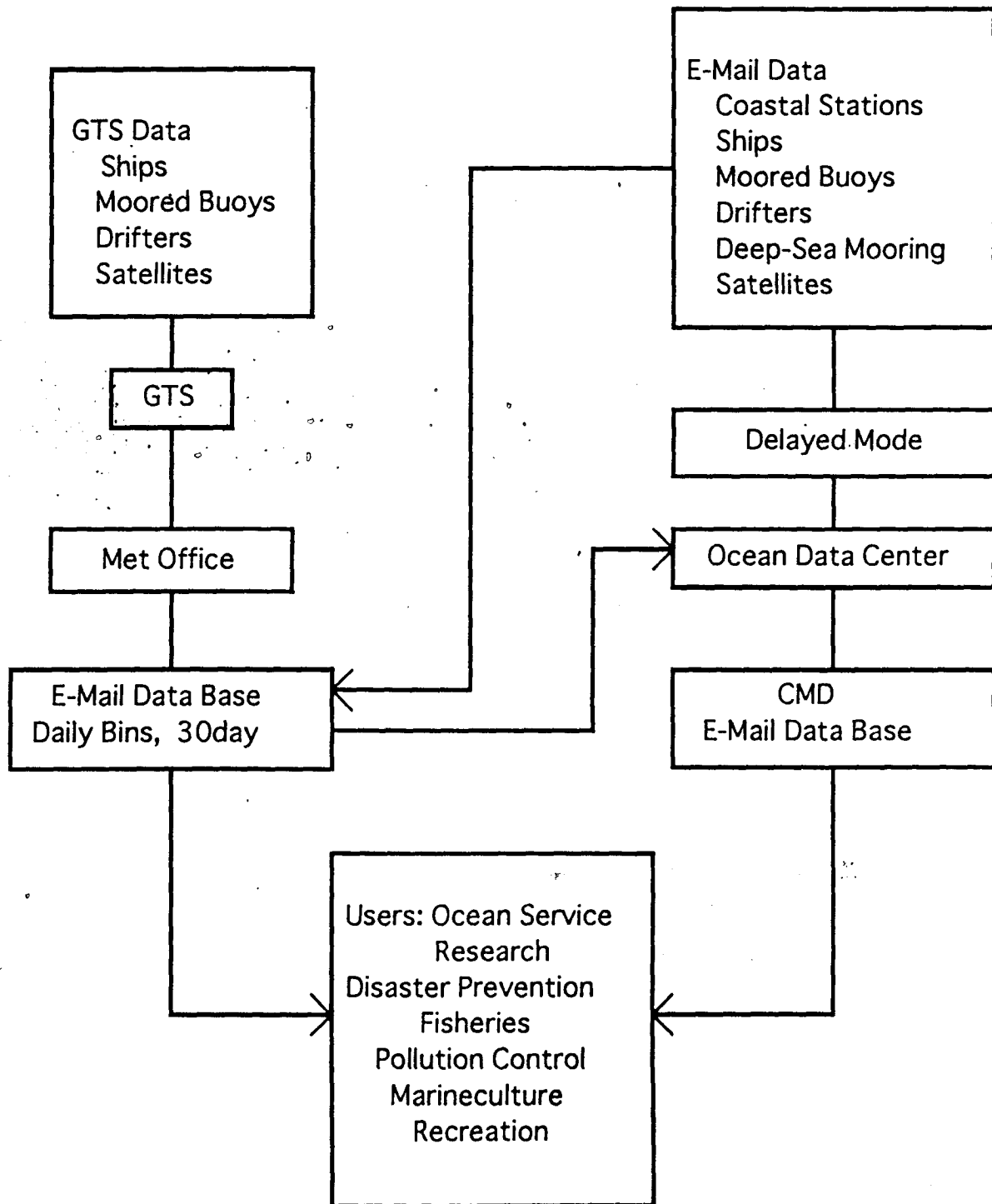
The Participating Countries shall endeavor to cover financial requirement of NEAR-GOOS related activities, directly or through voluntary contributions to the IOC Trust Fund. IOC shall endeavor to facilitate its financial allocation for NEAR-GOOS as a regional project under the framework of GOOS and NEAR-GOOS related activities in co-operation with other co-sponsor organizations for GOOS.

Appendix 1



Appendix 2

# NEAR-GOOS Data Flow



### Appendix 3

## REAL-TIME DATA BASE IMPLEMENTATION PLAN FOR NEAR-GOOS

### *Japan Meteorological Agency*

In the framework of NEAR-GOOS, a data base which collects oceanographic data exchanged over the Global Telecommunication System (GTS) as well as the data reported via non-GTS telecommunication means (i.e. Internet) is being planned. ( see Fig. 1 )

The Japan Meteorological Agency (JMA) which operates a Regional Telecommunication Hub (RTH) of GTS and serves as a Specialized Oceanographic Center of IOC/WMO Integrated Global Ocean Services System (IGOSS) will operate the Real-time Database to collect oceanographic data in the NEAR GOOS area and to distribute them within 30 days after collection. Data passed 30 days after collection are transferred to the NEAR-GOOS Delayed Mode data base.

Oceanographic data exchanged over the GTS are collected by the Computer System for Meteorological Services (COSMETS) of the Japan Meteorological Agency which plays a role of Regional Telecommunication Hub (RTH) of GTS, and are transferred to the NEAR-GOOS Real Time Data base.

Following data reports in International Code Forms (regulated by WMO) are suggested for GTS transmission:

FM 13 SHIP:	Report of surface observation from a sea station.
FM 18 BUOY:	Report of a buoy observation.
FM 62 TRACKOB:	Report of a marine surface observation along a ship's track.
FM 63 BATHY:	Report of bathythermal observation.
FM 64 TESAC:	Temperature, salinity and current report from a sea station.
FM 92 GRIB:	Processed data in the form of grid-point value expressed in binary form

Oceanographic data which are not exchanged over the GTS are reported to the NEAR-GOOS Real-time Database by the Data Nodes/Centers of member countries as well as relevant organizations in Japan via Internet in International Code Forms.

World Wide Web (WWW) server set at the database enables users to browse and transfer datasets. File Transfer Protocol (FTP) is also available. For the security of the data system, the registered users are permitted to access the data base.

A Report of NEAR-GOOS Real Time Database: will be distributed to the member countries, users and relevant authorities on a regular basis. The Report will contain the status of data reporting number of access to the database as well as users requirements.

## **DELAYED MODE DATA BASE IMPLEMENTATION PLAN FOR NEAR-GOOS**

*Japan Oceanographic Data Center, Maritime Safety Agency*

Japan Oceanographic Data Center (JODC) is one of the National Oceanographic Data Center within the framework of the International Oceanographic Data and Information Exchange (IODE) promoted by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Education, Science and Culture Organization (UNESCO).

JODC serves as the Responsible National Oceanographic Data Centers (RNODC) for Integrated Global Oceanographic Service System (IGOSS) for WESTPAC, and for Acoustic Doppler Current Profiler (ADCP) data. As a part of the RNODC-WESTPAC activities, JODC believes that it would be most appropriate that JODC serve as the data center for NEAR-GOOS Delayed Mode data base.

The oceanographic data stored in the NEAR-GOOS Real Time data base will be managed by J-DOSS, the data service system at JODC, in a batch mode for archiving as Continuously Managed Database (CMD) combined with the detail data that are submitted in a delayed mode. The J-DOSS is an on-line data service system using a relational data base, which is linked to Internet. Anybody interested in JODC are welcome to get information from JODC Home Page over Internet. JODC's World Wide Web server is so established that subscribers of JODC Home Page can easily retrieve not only information such as cruise inventory but also data itself from within WWW server. The Home page is linked to the JODC Data On-line Service System (J-DOSS), which enables subscribers of the JODC Homepage to directly operate the Oracle based J-DOSS RDBMS.