



**Intergovernmental Oceanographic Commission**  
*Report of Meetings of Experts and Equivalent Bodies*

# **IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS)**

## **First Meeting**

Bangkok, Thailand  
4-6 September 1996

**UNESCO**

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IOC/WESTPAC-NEAR-GOOS-CC-I  
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## **1. OPENING**

Prof. Keisuke Taira, Chairman of the IOC Sub-Commission for the Western Pacific (WESTPAC) called the meeting to order at 09:00 hours on 4 September 1996. He welcomed all members of the Committee and the invited experts to the meeting. The list of the participants is attached as Annex III. Reviewing the development of NEAR-GOOS, he emphasized that NEAR-GOOS should be operational as soon as the Implementation Plan and Operation Manual are prepared and finalized at the meeting. Prof. Taira expressed his sincere thanks to the Government of Thailand for hosting the meeting and to the IOC Regional Secretariat for WESTPAC as well as the IOC staff who have been involved in the preparation of this meeting.

The Chairman then introduced Dr. Suvit Vibulsresth, Secretary-General of the National Research Council of Thailand (NRCT) and invited him to address the meeting. Dr. Suvit welcomed all the participants attending the First Meeting of the NEAR-GOOS Co-ordinating Committee to Thailand and expressed his hope that the project would become operational in the near future. He reminded the meeting that one of the objectives of the NEAR-GOOS is to expand the operation system to the entire WESTPAC region. With this in mind, the Secretary-General confirmed the willingness and support of the Government of Thailand to co-operate with IOC and experts in the region to develop the projects in the framework of GOOS and to share the experiences obtained by Thai scientists from similar projects, e.g., SEAWATCH THAILAND and development of SEACAMP.

On behalf of Dr. Gunnar Kullenberg, Executive Secretary IOC, Mr. Yihang Jiang, IOC Assistant Secretary for WESTPAC, welcomed all the participants to the IOC Regional Secretariat and expressed appreciation to all the experts involved in the development of NEAR-GOOS, and particularly the Japan Meteorological Agency (JMA) and the Japan Oceanographic Data Centre (JODC) for their contribution in form of the preparation of the draft operation manual for NEAR-GOOS. He transmitted a message of best wishes and support from Dr. Kullenberg for the operation of NEAR-GOOS.

With reference to the Recommendation of the Third Session of the IOC Sub-Commission for Western Pacific (IOC/SC-WESTPAC-III), Mr. Jiang informed the meeting that nominations from the participating countries had been received by the Secretariat. The composition of the Co-ordinating Committee is given in Annex III.

## **2. ADMINISTRATIVE ARRANGEMENTS**

### **2.1 ADOPTION OF THE AGENDA**

Mr. Yihang Jiang introduced the Provisional Agenda and emphasized the main tasks of the meeting, including completion of the Implementation Plan and the preparation of the Operation Manual for NEAR-GOOS.

The Committee adopted the Agenda as attached in Annex I.

### **2.2 ELECTION OF THE CHAIRMAN OF THE COMMITTEE**

The Chairman of IOC/WESTPAC introduced the decision of the IOC/SC-WESTPAC-III and invited nominations for the Chairman of the Co-ordinating Committee. The Delegate of the Russian Federation nominated Mr. Naoyuki Hasegawa of Japan and the nomination was seconded by the Chinese Delegation. Mr. Hasegawa was thereafter elected by acclamation. The Committee agreed that the Chairman would serve as Co-ordinator of the Committee for a maximum of two terms, and his duties would be as defined by the IOC/SC-WESTPAC-III.

### **2.3 DESIGNATION OF RAPPORTEUR**

The Delegate of China nominated Dr. Alexander Tkalin as the Rapporteur and this proposal was seconded by the Delegate of Japan. Dr. Tkalin was designated as the Rapporteur.

## 2.4 WORKING ARRANGEMENTS

The Assistant Secretary informed the meeting on the working arrangements and it was agreed that the Committee would, as far as possible, work in plenary with drafting groups for special issues to be formed as required.

## 3. COMPLETION OF THE NEAR-GOOS IMPLEMENTATION PLAN

Reviewing the background information on development of NEAR-GOOS, Prof. Taira, leader of the drafting group for the Implementation Plan, informed the meeting that the plan had been discussed in the Expanded Experts Workshop (Bangkok, Thailand, January 1996) and had been submitted to the IOC/SC-WESTPAC-III. Some modifications had been made on the text of the Implementation Plan according to the comments from the participating countries in light of the discussion during the IOC/SC-WESTPAC-III. With the understanding that the location of the proposed NEAR-GOOS data bases will be discussed further under Agenda Item 4, the meeting agreed on the Implementation Plan with minor changes. The Implementation Plan is attached as Annex V to this document. The Delegation of China informed the meeting that in the initial operational phase of NEAR-GOOS, oceanographic data from the Bohai Sea will not be provided. The Assistant Secretary proposed to publish the Plan, together with the Operation Manual in the IOC publication series. The Committee agreed to this proposal.

## 4. PREPARATION OF OPERATIONAL MANUALS

### 4.1 REVIEW OF THE SITUATION OF DATA ASSESSMENT AND THE REPORTING SYSTEM IN PARTICIPATING COUNTRIES

Representatives presented review reports which provided information on the progress achieved in their respective countries.

#### **China**

The State Oceanic Administration (SOA) will actively participate in the NEAR-GOOS project. The following effort had been made to promote the implementation of NEAR-GOOS in China:

- (i) Designation the National Marine Environment Forecasting Centre and the National Marine Data and Information Service as the responsible units for establishment of relevant real time and delayed mode data bases in the country, respectively, and to enhance the activities defined in the NEAR-GOOS Implementation Plan;
- (ii) Arrangements for computer and telecommunication systems required to access and contribute to the NEAR-GOOS RTDB and DMDB;
- (iii) Definition of the data to be available for NEAR-GOOS including information from coast stations, ship reports and data obtained from research vessels on the repeated sections.

#### **Japan**

Ocean observations are carried out by the Japan Meteorological Agency, Hydrographic Department, Fisheries Agency, Fisheries Observation Stations of local governments, the Japan Marine Science and Technology Centre, and universities. Several repeated sections are occupied, monthly or seasonally, by the Japan Meteorological Agency, Hydrographic Department, Fisheries Agency, Fisheries Observation Stations of local governments. Oceanographic data are reported on the basis of IGOSS and IODE. Ten-day reports or bi-monthly reports on temperature at selected depth and surface currents are published and distributed by the Japan Meteorological Agency, Hydrographic Office, Fisheries Agency, Fisheries Observation Stations of local governments. In 1994, a NEAR-GOOS working group was formed under the National Committee for IOC, composed of the Japan

Meteorological Agency, Hydrographic Office, Fisheries Agency, Science and Technology Agency, and the Ocean Research Institute, University of Tokyo, with secretarial services of the Ministry of Education, Science, Sports, and Culture. The working group has met times in the past two years. Japan is now ready to join NEAR-GOOS. The Japan Meteorological Agency and the Japan Oceanographic Data Centre are willing and ready to host the NEAR-GOOS data bases according to the Operation Manual submitted to the NEAR-GOOS Co-ordinating-Committee.

Research groups at universities have been supported by the Ministry of Education to carry out basic studies to establish GOOS from 1993 to 1997 . An International Co-operative Research Project on NEAR-GOOS is in the planning stage. It will include the monitoring of volume-transport of the Kuroshio in the NEAR-GOOS area using submarine cables between Hamada and Pusan, Okinawa and Taiwan, and between Okinawa and the Philippines. Data assimilation and forecasting of sea conditions are planned by using NEAR-GOOS data bases.

### **Republic of Korea**

A new Ministry of Maritime Affairs and Fisheries was established in the Republic of Korea, merging the ocean-related functions of the Ministry of Science and Technology, Fisheries Agency, the Ministry of transport and the Hydrographic Office. Ocean observations have been regularly carried out mainly by the Fisheries Agency and the Hydrographic Office. The Fisheries Agency conducts monthly oceanographic observations at approximately 300 stations points along the coast of the Korean Peninsula.

The Hydrographic Office carries out CTD and ADCP measurements every second month at approximately 300 points south of Cheju Island. 23 tide monitoring stations were established along the coast of the Korean Peninsula, for the purpose of measuring tides and sea surface temperature, among which 10 stations are operated on a real-time basis. Near harbours, a total of 88 stations are operational in measuring and recording tidal currents. Additionally, the Korea Ocean Research and Development Institute (KORDI) has installed several wave stations. In 1996 the Korean Hydrographic Office completed its preparation of the establishment of its Internet Web Site. The information and data collected and collated from 1957 to 1996 have already been put into a database and will be provided to researchers and the general public.

Among the Hydrographic Office, Fisheries Agency and KORDI, the Director of KORDI will designate one agency as the responsible agency for operation of NEAR-GOOS in Korea. Once chosen and designated, this agency will actively assist the implementation of NEAR-GOOS.

### **Russian Federation**

The Federal Service of Russia on Hydrometeorology and Environmental Monitoring (ROSHYDROMET) is responsible for collection, processing and storage of oceanographic and meteorological data. These data are stored in the Russian National Oceanographic Data Centre (World Data Centre B), Obninsk (near Moscow). ROSHYDROMET was designated by the Russian National Oceanographic Committee to be responsible for implementation of GOOS , including EuroGOOS and NEAR-GOOS.

In 1994, the branch of the Russian National Oceanographic Data Centre was established in Vladivostok. The Far Eastern Regional Hydrometeorological Research Institute (FERHRI) provided computers and other facilities for this Regional Oceanographic Data Centre (RODC). The Head of RODC is Dr. N.A. Rykov. FERHRI, in co-operation with RODC and other ROSHYDROMET organizations, is responsible for NEAR-GOOS implementation in Russia.

According to existing national regulations, necessary actions will be carried out to release oceanographic data for international exchange (i.e., for inclusion in NEAR-GOOS databases). The test data exchange with the RTDB and DMDB will be carried out until the end of 1996 after FERHRI and RODC become the registered users of NEAR-GOOS.

Close co-operation on technical issues, such as quality control, processing software, communication lines, etc., with JMA and JODC will be carried out continuously. Some technical problems will be also considered in co-operation with ROSHYDROMET Headquarters in Moscow, and IOC Secretariat.

The Committee expressed its appreciation to all the representatives from participating countries for the encouraging progress achieved, especially for the potential contributions of data and the data products to NEAR-GOOS. The Committee welcomed the statements made by all participating countries on their readiness to start the operation of NEAR-GOOS.

The Committee adopted Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I. 1.

#### 4.2 PREPARATION OF THE OPERATION MANUAL FOR SPECIFIC VARIABLES, DATA STANDARDS AND FORMATS

Referring to document IOC/WESTPAC-NEAR-GOOS-CC/4 (now as Annex VI), Mr. Hasegawa and Mr. Tatsuno introduced the draft operation manual on real-time and delayed mode data bases, respectively. The Committee received written comments from Dr. D. Y. Lee, (a member of the Committee), who was unable to attend. Due consideration was given to the views expressed by Dr. Lee.

##### (i) *Framework of NEAR-GOOS*

The meeting recognized the generous support provided by JMA and JODC and it agreed to establish the Real-Time Data Base (RTDB) and Delayed Mode Data Base (DMDB) for NEAR-GOOS in JMA and JODC, respectively.

To ensure an effective operation of the system, particularly for data access and distribution, the Committee agreed that the establishment of Associated Data Bases should be encouraged in the participating countries as functional servers.

##### (ii) *Access to the Data Bases*

The Committee felt that the oceanographic data in NEAR-GOOS should be made available, free of charge, to all users who are interested in contributing and making access to the data bases. However, in order to ensure the security of the database and encourage wider contribution of oceanographic data to the system, and taking into account the variety of data management systems in different countries, the Committee felt that it would be necessary to form a sessional working group to work on this issue, as well as other relevant issues related to the Operation Manual.

The Committee considered the suggestions of the sessional working group on the access to the data bases and agreed that all arrangements with regard to NEAR-GOOS should be made with a view to increasing the volume of exchanged oceanographic data, taking into consideration the different national policies and practices concerning data exchange. In this regard, the registration procedures defined in the Operation Manual are only tentative. The Committee agreed to keep reviewing the impact of the current procedures in the initial phase of data exchange through NEAR-GOOS databases. If required, the registration procedures may be modified.

##### (iii) *Data Formats*

It was recognized that the data format of the system is an important issue for easy utilization of the data and data products provided through the system, as well as for attracting more interest for NEAR-GOOS. However, in view of the diverse formats used by the different data producers, especially for GTS and non-GTS data, the Committee agreed to start the NEAR-GOOS operation with existing material from various sources, with clear instructions and descriptions of the formats used. The Committee will carry out studies in this respect and adopt the format and the coding system during the implementation of NEAR-GOOS.

The Committee recognized that data quality assurance and quality control is an important aspect for the operation of NEAR-GOOS in order to obtain reliable data and provide better services. However, in view of the different data formats introduced in the initial phase of the operation, and the various existing QA/QC procedures, the Committee agreed that further efforts are needed to develop the NEAR-GOOS procedures for QA/QC. At the present stage, it is expected that data contributors will take the responsibility for data quality control.

Recognizing the importance of homepage for users to get access, and contribute to the databases established by NEAR-GOOS, the Committee decided that the NEAR-GOOS homepage should be developed and maintained by the IOC-GOOS Support Office, as necessary facilities are not available in the IOC Regional Secretariat for WESTPAC. The homepages for RTDB and DMDB will be developed by the managers of the respective databases. The Committee agreed that the comments and suggestions on the design of the homepages will be transmitted to the managers concerned by e-mail.

The Committee realized the need for co-ordination with WMO, a co-sponsor of GOOS, in terms of including more oceanographic parameters in its GTS data exchange.

The Committee reviewed the revised version of the Operation Manual, and agreed that since possible modification to the Operation Manual is anticipated, a version number should be given to different versions of the Operation Manual, starting from the present manual which is regarded as version 1.0.

## **5. FUTURE ACTIONS**

### **5.1 DISCUSSION ON FUTURE ACTIONS IN OPERATING NEAR-GOOS, INCLUDING IDENTIFICATION OF NECESSARY RESOURCES FOR THE ACTIONS**

The Committee discussed future activities to be carried out, taking into account that NEAR-GOOS will soon be in the initial phase of operation. The Committee agreed that the Implementation Plan and Operation Manual should be published in the IOC publication series. Furthermore, in order to encourage active participation of all communities interested in the project, the Committee felt that it is necessary to translate the Plan and the Manual into the languages of the participating countries. Members of the Committee should be encouraged to find all possible ways and means to publish the documents in different languages of the region. The delegations of Japan and China informed the Committee that the required translation and publication, will be undertaken in their countries.

The Committee recognized that training is one of the important aspects for the NEAR-GOOS operation, especially in the initial phase, considering the new technology introduced to the NEAR-GOOS data flow. The Committee encouraged participating countries to identify all possible means to enhance the training activities related to NEAR-GOOS. The Delegation of Japan informed the Committee that a training course could be organized in JODC concerning on-line data exchange to enhance the implementation of NEAR-GOOS. The Committee expressed appreciation to the Delegation of Japan for offering the opportunity and support for such a training course regarding on-line data exchange for the WESTPAC Member States, and requested the WESTPAC Secretariat and the GOOS Support Office to work out a detailed programme, in consultation with the experts and organizations concerned.

The Committee adopted Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I. 2

### **5.2 CO-OPERATION WITH OTHER PROGRAMMES AND ORGANIZATIONS**

Mr. Nakamura, the representative of UNEP, informed the Committee of the UNEP North West Pacific Action Plan (NOWPAP). He indicated that co-operation and co-ordination with the NEAR-GOOS project should be considered in the five priority projects identified by the Member States of NOWPAP. He informed the meeting that UNEP will have its experts' meeting in Bangkok, 9-11 September 1996, and IOC was invited to participate and present to the meeting the IOC/WESTPAC programmes, especially NEAR-GOOS.

The Committee felt that co-operation with other international and regional organizations was essential to enhance the operation of NEAR-GOOS, and requested the Assistant Secretary for WESTPAC to present the outcomes of this meeting to the UNEP/NOWPAP meeting. The Committee stressed that co-operation with other organizations, such as APEC Marine Resources Conservation Working Group and the project on Circulation Research in the East Asian Marginal Seas (CREAMS), etc. should also be strongly encouraged.

### **5.3 REVISION OF THE TERMS OF REFERENCE OF THE CO-ORDINATING COMMITTEE**

Since part of the tasks assigned to the Committee by IOC/SC-WESTPAC-III have already been completed, the Committee felt that it is necessary to make modifications to the Terms of Reference of the Committee. The revised Terms of Reference is proposed in Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I.3.

## **6. ADOPTION OF EXECUTIVE SUMMARY REPORT**

The Committee agreed on the Operation Manual for NEAR-GOOS and invited the Chairman of IOC/WESTPAC to introduce the Implementation Plan and Operation Manual to the 29th Session of the IOC Executive Council, to be held in Paris, 24 September-2 October 1996. The Operation Manual is attached as Annex VI.

Recognizing that the NEAR-GOOS databases will soon come into operation, and will become fully operational beginning from 1997, and the 19th Session of the IOC Assembly will be held in early July 1997, the Committee felt that the appropriate date for the next meeting should be some time around April/May 1997, preferably at the IOC Regional Secretariat for WESTPAC, unless an invitation from a participating country is received by the Committee.

## **7. CLOSURE**

The Chairman of IOC/WESTPAC, Professor Taira, thanked all participants for their co-operation and hard work during the meeting. He expressed his wishes for continued co-operation among the members of the Committee to ensure the successful operation of the system. He thanked IOC Regional Secretariat for the help and assistance provided during the meeting.

The Delegate of Russia expressed, on behalf of all delegations, his thanks to the Chairman of the Committee for his effective guidance during the discussions, thus ensuring the success of the meeting. He also thanked the secretariat staff for their efforts during the meeting.

The Chairman closed the meeting at 12:30 hours, on 6 September 1996.

## ANNEX I

### AGENDA

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- 2. ADMINISTRATIVE ARRANGEMENTS**
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  - 2.2 ELECTION OF THE CHAIRMAN OF THE COMMITTEE
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- 3. COMPLETION OF THE NEAR-GOOS IMPLEMENTATION PLAN**
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- 5. FUTURE ACTIONS**
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- 6. ADOPTION OF THE EXECUTIVE SUMMARY REPORT**
- 7. CLOSURE**

## ANNEX II

### RECOMMENDATIONS

#### Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I.1

##### INITIATION AND FUTURE DEVELOPMENT OF NEAR-GOOS

The NEAR-GOOS Co-ordinating Committee,

**Noting** that the IOC/SC-WESTPAC-III adopted NEAR-GOOS as a programme of the Sub-Commission,

**Bearing** in mind the need to promote exchange of technology and expertise,

**Keeping** in mind the kind offer of Japan Meteorological Agency and Japan Oceanographic Data Center to operate the Real Time Data Base (RTDB) and Delayed Mode Data Base (DMDB), respectively,

**Decides** that RTDB and DMDB be operated in JMA and JODC, and Associate Data Bases shall be established for effective collection and dissemination of oceanographic data in the region,

**Urges** the participating countries to start operation for the initial phase of NEAR-GOOS as defined in the Implementation Plan and the Operation Manual;

**Urges further** participating countries to continue their efforts to develop the regional project of GOOS in extended area and to enhance services, including monitoring etc.;

**Encourages** all institutions of the member states of IOC who carrying out the ocean observations in the NEAR-GOOS region to provide the observed data to the NEAR-GOOS data bases;

**Recommends** all users in the NEAR-GOOS region, WESTPAC region and other regions to actively participate in the NEAR-GOOS and provide their comments for the improvement of the operation;

**Requests** the Executive Secretary IOC to take necessary actions on:

- (i) informing the GOOS community of the initiation of NEAR-GOOS,
- (ii) encouraging wide participation in NEAR-GOOS,
- (iii) provide financial support to the activities defined by the NEAR-GOOS Co-ordinating Committee.

#### Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I.2

##### TRAINING ACTIVITIES OF NEAR-GOOS

The NEAR-GOOS Co-ordinating Committee,

**Noting** that electronic communication is assumed to be use for data flow of NEAR-GOOS and such that technology is urgently needed for those who interested in NEAR-GOOS data exchange,

**Further noting** that the existing training activities including "WESTPAC Data Management Training", which has been carried out by JODC as an activity of the RNODC-WESTPAC more than ten years,

**Encourages** all participating countries to make efforts on the training activities for NEAR-GOOS;

**Invites** the JODC to organize a series training courses on NEAR-GOOS data management with necessary assistance from the JMA and Ocean Research Institute, University of Tokyo, and the financial support from IOC;

**Requests** the Executive Secretary IOC to take necessary actions for:

- (i) finding necessary resources for NEAR-GOOS training activity,
- (ii) inviting WESTPAC member states to nominate trainees for the training activities.

### **Recommendation IOC/WESTPAC-NEAR-GOOS-CC-I.3**

#### **TERMS OF REFERENCE OF THE NEAR-GOOS CO-ORDINATING COMMITTEE**

The NEAR-GOOS Co-ordinating Committee,

**Recalling** the Recommendation SC-WESTPAC-III.4 on the Third Session of the IOC Sub-Commission for WESTPAC on NEAR-GOOS,

**Nothing** that the First Session of the NEAR-GOOS Co-ordinating Committee has completed the Implementation Plan and the Operation Manual for the NEAR-GOOS,

**Recognizing** the importance to demonstrate the usefulness of a regional ocean observing system,

**Recommends** that the terms of reference be amended as given in the Annex to this recommendation.

#### **Annex to the Recommendation**

##### **TERMS OF REFERENCE FOR THE CO-ORDINATING COMMITTEE FOR NEAR-GOOS**

The Co-ordinating Committee shall have the following:

1. 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 and from NEAR-GOOS Real Time Data Base and Delayed Mode Data Base. The Committee shall elect a Chairman among the members. The Chairman of the Co-ordinating Committee will serve as the NEAR-GOOS Co-ordinator. The Committee shall meet to the extent possible in regular annual sessions at the expense of the participating countries. Other countries can attend the sessions as observers.

2. TERMS OF REFERENCE:

- (i) Review the Implementation Plan of the NEAR-GOOS;
- (ii) Keep up-dating the Operation Manual for the data exchange;
- (iii) Review the situation of access to and data reporting by the participating countries and others;
- (iv) Review the achievements of the NEAR-GOOS and report to the IOC Sub-Commission for WESTPAC and through the Sub-Commission to the participating Member States.
- (v) Make necessary recommendations and to advise the participating countries;
- (vi) Review data and information infrastructure and allocation of observing platforms by the participating countries and advise on their improvements;
- (vii) Prepare an annual report of NEAR-GOOS for distribution to the Member States through IOC Regional Secretariat for WESTPAC. This report shall be retained in the data base for reference by the registered users.

ANNEX III

LIST OF PARTICIPANTS

I. MEMBERS OF THE COMMITTEE

Mr. Naoyuki **HASEGAWA**  
"El Niño" Monitoring Center  
Japan Meteorological Agency  
1-3-4 Otemachi, Chiyoda-ku  
Tokyo 100  
JAPAN  
Tel: (81-3) 3212 8341 - ext 5135  
fax: (81-3) 3211 3047  
E-mail: hasegawa@umi.hq.kishou.go.jp

Mr. Tadao **TATSUNO**  
Director,  
Japan Oceanographic Data Center  
(JODC)  
5-3-1 Tsukiji, Chuo-ku  
Tokyo 104,  
JAPAN  
Tel: (81-3) 3541-3818  
Fax: (81-3) 3545-2885  
E-mail: mail@jodc.jhd.go.jp

Dr. Alexander V. **TKALIN**  
Far Eastern Regional Hydrometeorological  
Research Institute  
Vladivostok 690600  
RUSSIAN FEDERATION  
Tel: (7-4232) 22 48 87  
Fax: (7-4232) 22 77 54  
E-mail: fehri@stv.iasnet.com

Dr. Hong **WANG**  
Director  
Science and Technology Dept. (NMDIS)  
State Oceanic Administration  
93 Liuwei Road, Hedong District  
Tianjin 300171,  
CHINA  
Tel: (86-22) 430-0872 - ext 3713  
Fax: (86-22) 430-4408

Mr. Renmiao **YE**  
Director  
Department of Marine Monitoring and Service  
State Oceanic Administration  
1 Fuxingmenwai Aven.  
Beijing 100860  
CHINA  
Tel: (86-10) 6853-2211 ext 5731  
Fax: (86-10) 6853 3515

II. INVITED EXPERTS

Mr. Young Sub **CHOI**  
Director, Oceanographic Division  
Korea Hydrographic Office  
1-17 Hang-Dong, Chung-ku  
Inchon  
REPUBLIC OF KOREA  
Tel: (82-32) 885-3826  
Fax: (82-32) 885-3829

Prof. Manuwadi **HUNGSPREUGS**  
Marine Science Department  
Chulalongkorn University  
Bangkok  
THAILAND 10330  
Tel: 662 2185410  
Fax: 662 2511951, 2550780

Dr. S. **MANICKAM**  
Lecturer in Economics  
A.P.S.A. College  
Tiruppattur-630 211  
Tamil Nadu  
INDIA  
Tel: (91-4577) 66 142  
Fax: (91-4577) 66 308

Dr. Shigeki **MITSUMOTO**  
Senior Research Scientist  
National Institute for Environmental Studies  
16-2, Onogawa,  
Tsukuba 305  
JAPAN  
Tel: (81-298) 50-2531 (dial-in)  
Fax: (81-298) 51-4732  
E-mail: mitumoto@nies.go.jp

LCDR. Sommart **NIEMNIL**, RTN.  
Oceanographic Division  
Hydrographic Department  
Arun-Amarin Rd.  
Bangkok 10600  
THAILAND  
Tel: (66-2) 465-2328  
Fax: (66-2) 472-1286  
E-mail: somchai@fc.nrct.go.th

Dr. Anond **SNIDVONGS**  
Marine Science Department  
Chulalongkorn University  
Bangkok  
THAILAND 10330  
Tel: (66-2) 218-5410  
Fax: (66-2) 251-1951/255-0780  
E-mail: sanond 1@chula.ac.th  
anond@start.or.th

Dr. Xuejia **SONG**  
Deputy Director  
National Marine Environmental  
Forecasting Center  
State Oceanic Administration  
No. 8 Da Hui Si  
Haidian Diviaion  
Beijing 100081  
CHINA  
Tel: (86-10) 6217-3623  
Fax: (86-10) 6217-3620

Ms. Kanya **THISAYAKORN**  
Remote Sensing Division  
National Research Council of Thailand  
Bangkok 10900  
THAILAND  
Tel: (66-2) 562-0428  
Fax: (66-2) 562-0429  
E-mail: Kanya@fa.nrct.go.th

### III. ORGANIZATIONS

#### Intergovernmental Oceanographic Commission (IOC)

Prof. Keisuke **TAIRA**  
(Chairman WESTPAC)  
Ocean Research Institute  
University of Tokyo  
1-15-1 Minamidai, Nakano-ku  
Tokyo 164  
JAPAN  
Tel: (81-3) 5351-6417  
Fax: (81-3) 5351-6418  
E-mail: taira@ori.u-tokyo.ac.jp

#### United Nations Environment Programme (UNEP)

Mr. Takehiro **NAKAMURA**  
Programme Officer  
UNEP  
P.O. Box 30552  
Nairobi  
KENYA  
Tel: (254-2) 62 3886  
Fax: (254-2) 62 42949  
E-mail: Takehiro.Nakamura@unep.org

### IV. SECRETARIAT

Mr. Yihang **JIANG**  
Ms. Wandee **CHINESAWAT**  
Ms. Kanlayanee **THIRARONNARONG**

IOC Regional Secretariat for WESTPAC  
196, Phaholyothin Road  
Chatujak  
Bangkok 10900  
THAILAND  
Tel: (66-2) 561 5118  
Fax: (66-2) 561 5119  
E-mail: westpac@samart.co.th

Ms. Naoko **ICHIYAMA**  
GOOS Support Office  
Intergovernmental Oceanographic  
Commission (IOC), UNESCO,  
1, rue Miollis  
75732 Paris Cedex 15  
FRANCE  
Tel: (33-1) 4568-3974  
Fax: (33-1) 4568-5812  
E-mail: n.ichiyama@unesco.org

ANNEX IV

**MEMBERS OF THE NEAR-GOOS CO-ORDINATING COMMITTEE**

Prof. Victor A. AKULICHEV  
Director, Pacific Oceanological Institute  
43 Baltyskaya Street  
690041 Vladivostok  
Russian Federation  
Tel: (7-4232) 311400  
Fax: (7-4232) 312 573/312 600  
E-mail: akulich@imtp.marine.su

Dr. Alexander V. TKALIN  
Far Eastern Regional Hydrometeorological  
Research Institute  
Vladivostok 690600  
Russian Federation  
Tel: (7-4232) 22 48 87  
Fax: (7-4232) 22 77 54  
Email: fehri@stv.iasnet.com

Dr. Sangbok D. HAHN  
Director, Oceanographic Division  
National Fisheries Research and  
Development Agency  
Shirang-ri, Kijang-up, Kijang-gun  
Pusan 619-900,  
Republic of Korea  
Tel: (82-51) 720-2210  
Fax: (82-51) 720-2225  
E-mail: mrsl@haema.nfrda.re.kr

Dr. Hong WANG  
Director  
Science and Technology Dept. (NMDIS)  
State Oceanic Administration  
93 Liuwei Road, Hedong District  
Tianjin 300171,  
China  
Tel: (86-22) 430-0872 - ext 3713  
Fax: (86-22) 430-4408

Mr. Naoyuki HASEGAWA (*Chairman*)  
"El Niño" Monitoring Center  
Japan Meteorological Agency  
1-3-4 Otemachi, Chiyoda-ku  
Tokyo 100  
Japan  
Tel: (81-3) 3212 8341 - ext 5135  
fax: (81-3) 3211 3047  
E-mail: hasegawa@umi.hq.kishou.go.jp

Mr. Renmiao YE  
Director  
Department of Marine Monitoring and Service  
State Oceanic Administration  
1 Fuxingmenwai Aven.  
Beijing 100860  
China  
Tel: (86-10) 6853-2211 - ext 5731  
Fax: (86-10) 6853 3515

**Associate Member from Russian  
Federation**

Dr. Dong-Young LEE  
Ocean Engineering Research & Development  
Institute (KORDI)  
P.O Box 29  
Ansan  
Republic of Korea  
Tel: (82-345) 400-6341  
Fax: (82-345) 408-5823/408-5820  
E-mail: dyl@sari.kordi.re.kr

Dr. Nicolai MIKHAILOV  
Director, National Oceanographic Center  
Russian Research Institute for  
Hydrometeorological Information  
6, Korolev Street  
249020 Obninsk, Kaluga Region  
Russian Federation  
Tel: (7-084) 39-25907  
Fax: (7-095) 255-1582  
E-mail: nodc@storm.iasnet.com

Mr. Tadao TATSUNO  
Director, Japan Oceanographic Data Center  
(JODC)  
5-3-1 Tsukiji, Chuo-ku  
Tokyo 104  
Japan  
Tel: (81-3) 3541-3818  
Fax: (81-3) 3545-2885  
E-mail: mail@jodc.jhd.go.jp

## ANNEX V

### **AN IMPLEMENTATION PLAN FOR THE INITIAL PHASE OF NORTH-EAST ASIAN REGIONAL GOOS (NEAR-GOOS)**

#### **1. INTRODUCTION AND BACKGROUND**

Substantial progress in ocean modeling, and *in situ* observation techniques and telecommunications, and remote sensing technology now makes an ocean observing system possible. Such a system can produce maps and forecasts of oceanographic conditions similar to those produced by meteorological activities. Although many ocean processes are strongly influenced by atmospheric forcing, their spatial scales are much smaller than those of the atmosphere one. Thus, the system requires oceanographic data collected as frequently as meteorological observations with much fine spatial resolutions, so it is most feasible to be established first for semi-enclosed seas. Such a system can contribute to regional ocean services, management of coastal areas, climate prediction, management of marine living resources, disaster prevention and preserving the health of the ocean, which coincide with ultimate goals of Global Ocean Observing System (GOOS).

The Intergovernmental Oceanographic Commission (IOC) has initiated GOOS in co-operation with the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), and the International Council of Scientific Unions (ICSU). It is important to demonstrate the usefulness of a regional ocean observing system by first establishing a pilot system with the co-operation of countries in a particular region 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 collect and exchange 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 the project. Following these consultations, a draft proposal was prepared for an operational demonstration: North-East Asian Regional GOOS (NEAR-GOOS).

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

Following review by the participants in the above-mentioned expert meetings, the proposal was submitted to the Intergovernmental Committee for GOOS (I-GOOS) Strategy Sub-Committee Meeting on 27-30 March 1995 in Geneva. The parallel informal session on NEAR-GOOS suggested that an *ad hoc* group be nominated by the Chairman of the IOC Sub-Commission for WESTPAC to draft an implementation plan for NEAR-GOOS. The group consists of four experts: Y. Xu (China), K. Taira (Japan), D.-Y. Lee (Korea) and V.E. Ryabinin (Russia). Dr. Taira was 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, both in June 1995. During these sessions, broad interest was shown in NEAR-GOOS as an effective means to implement the global GOOS concept at a regional level. A NEAR-GOOS Workshop was held at Pusan, Republic of 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.

At 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 expanding it to the entire WESTPAC region.

The Draft Proposal by the *ad hoc* group was reviewed and revised by the Expanded *ad hoc* Meeting for the NEAR-GOOS Implementation Plan in the IOC Regional Secretariat, Bangkok, 8-10 January 1996, resulting in the present proposal.

## **2. GOALS, SCIENTIFIC BASIS, AND OBJECTIVES OF NEAR-GOOS**

### **2.1 Goals**

The goals of the North-East Asian Regional GOOS (NEAR-GOOS) are as follows:

- (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 the efficiency of fishing vessels;
- (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 process directly induced by atmospheric forcing, such as winds, 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 the ocean surface.

Variations in 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 area, is of a few tens of kilometers, and resolution of a few kilometers 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 currents, presently made by several national agencies, is not sufficient to describe their continuous time evolution. A daily mapping of oceanographic conditions is requisite.

Present techniques for data assimilation can generate uniform mapping even from limited numbers of *in situ* data by making use of remote sensing data. Data assimilation made from the daily data set is useful for ocean services and other applications.

Physical processes in semi-enclosed seas are governed not only by local forcing such as surface fluxes from the atmosphere and mass fluxes from rivers, but also by water exchange with outer regions. The volume flux can now be estimated from sea level differences, satellite measurements by altimeter, electric measurement by submarine cables, and other means on a daily basis. Accurate forecasting of oceanographic conditions is at hand, but forecasting also needs a timely supply of *in situ* data.

Long-term observations are currently the only way to ascertain trends and low frequency variability of the ocean. There is a crucial need for robust and reliable data management system on a regional scale because of the quantity of data required.

### **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 are reported to the NEAR-GOOS Real-Time Data Base through the GTS (Global Telecommunication System,

WMO), or directly by electronic means. The whole data sets are to be transferred on a periodic basis from the Real-time data base to the NEAR-GOOS Delayed Mode data base. 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 the North-East Asian region, which is a part of the 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. (See Annex I)

#### **3.2 PRINCIPLE**

- (i) The participating countries recognize the importance of regional co operation, in particular in the North-East Asian region, for ocean observing and research activities, within the framework of the Global Ocean Observing System;
- (ii) Each participating country shall designate responsible organizations to participate in NEAR-GOOS;
- (iii) Each participating country shall implement NEAR GOOS in co-operation with IOC and the other organizations co-sponsoring GOOS;
- (iv) The participating countries shall 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;
- (v) The data obtained within the context of NEAR-GOOS shall be made available to the Data Bases, and shall be accessible to other countries within the framework of GOOS. To promote the exchange of data between the regions within the framework of GOOS, the participating countries shall co-operate with other regional activities related to GOOS. 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;
- (vi) 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 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. 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 in the world. Observations by research vessels have taken place routinely along sections for more than 50 years. Human activities in the region are extensive; thus, the need for environmental monitoring is crucial.

Ocean monitoring activities in the region include:

- (i) *In situ* data
  - by moored surface buoys, drifting buoys, towers, coastal stations, research vessels, and voluntary observation ships;
- (ii) Remote sensed data
  - geostationary and polar-orbiting meteorological satellites, and earth observation satellites.

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

The corresponding data flow is shown in Annex 2.

The implementation of NEAR-GOOS will require the collection of oceanographic data, as well as marine meteorological and other data. The marine meteorological data will be exchanged 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 GOOS is to establish a WWW equivalent for oceanography.

#### **4. INITIAL PHASE**

NEAR-GOOS will be implemented based on this plan, and a detailed Operational Manual prepared by the Co-ordinating Committee of NEAR-GOOS, which will be developed after discussion of 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 that the initial phase start with basic oceanographic variables, such as temperature, salinity, current and wind waves, and reported in real-time. When the on-line data base is prepared, the reporters can access their own data as well as those data reported internationally each day. It is expected that a rapid increase in data reports will be achieved by the system. The products from the data can be prepared by users for their own purposes. It is intended that NEAR-GOOS be a good demonstration of the capabilities of operational oceanography.

The outline of the NEAR-GOOS Real-time data base and the NEAR-GOOS Delayed Mode data base, proposed by the Japan Meteorological Agency and the Japan Ocean Data Center is shown in Annex III.

#### **5. INFRASTRUCTURE**

##### **5.1 NEAR-GOOS CO-ORDINATING COMMITTEE**

##### **Terms of Reference:**

- (i) Nature:
  - A Co-ordinating Committee is hereby established as a management body of NEAR-GOOS, for periodic review of the implementation of the overall system.

(ii) Composition:

The Committee will consist of representatives of all participating countries. Each country will designate two members who should be able to monitor data flow to the NEAR-GOOS Real-time and Delayed Mode data bases. The Committee will elect a Chairman and a Vice-Chairman among the members. The Chairman of the Co-ordinating Committee will serve as the NEAR-GOOS Co-ordinator. The committee shall meet in regular annual sessions. Non-participating countries can attend the sessions as observers.

(iii) Responsibility:

The NEAR-GOOS Co-ordinating Committee will:

- (a) prepare Operation Manuals for the data bases;
- (b) review access to and data reporting by the participating countries and others;
- (c) review the project area, parameters, data standards and formats, and advise and make recommendations to the participating countries;
- (d) review the data and information infrastructure and allocation of observing platforms by the participating countries and advise on possible improvements.

The Committee reports to the participating countries as well as to the IOC-Sub-Commission for WESTPAC.

The Committee co-ordinates the preparation of an annual report of NEAR-GOOS for distribution to the participating countries. This report will be retained in the Data Base for reference by the registered users.

## 5.2 NEAR-GOOS CO-ORDINATOR

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

## 5.3 SECRETARIAT

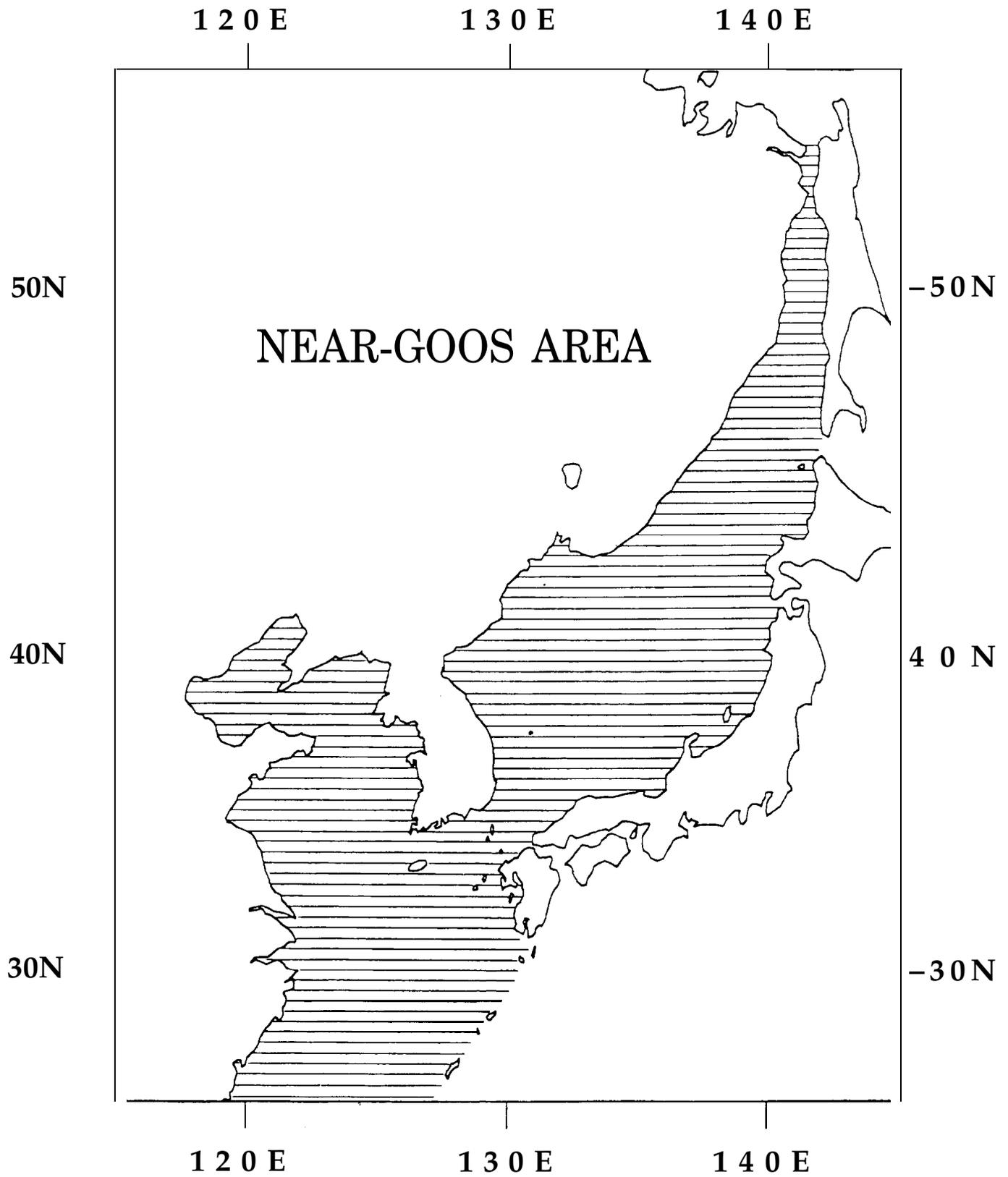
The IOC Regional Secretariat for WESTPAC will support the Committee.

## 5.4 FINANCIAL COMMITMENTS

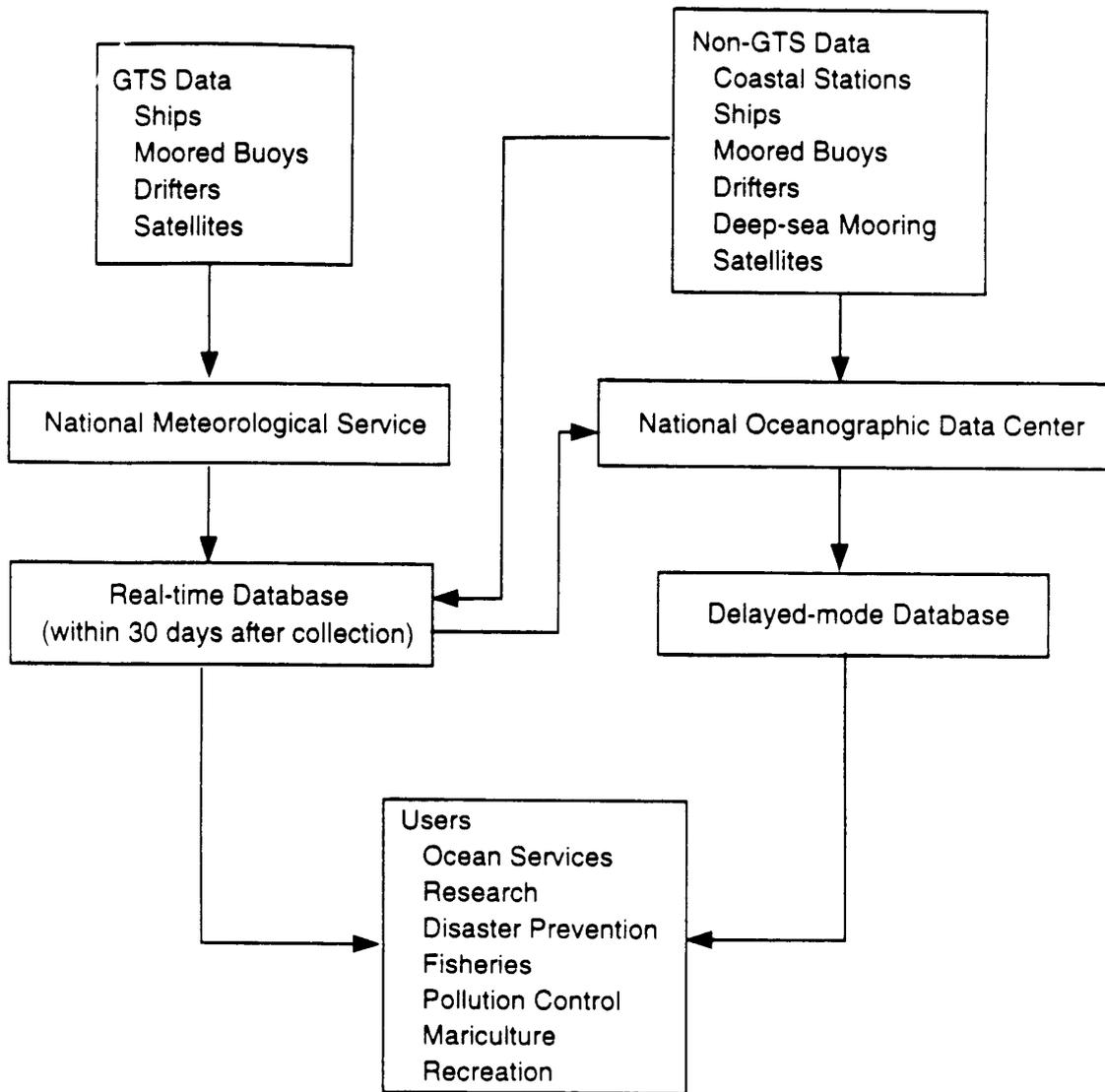
The participating countries and users are responsible for costs associated with access to Data Bases and their contribution to the NEAR-GOOS data report.

The participating countries will endeavor to cover the financial requirement of NEAR-GOOS related activities, directly or through voluntary contributions to the IOC Trust Fund. IOC will 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-sponsoring organizations of GOOS.

Appendix 1 to Annex V.



Appendix 2 to Annex V.



NEAR-GOOS Data Flow

### Appendix 3 to Annex V

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

### *Japan Meteorological Agency*

In the framework of NEAR-GOOS, a data base for 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 exchanged beyond 30 days after collection are transferred to the NEAR-GOOS Delayed Mode data base.

Oceanographic data exchanged over the GTS are captured by the Computer System for Meteorological Services (COSMETS) of the JAM, and are transferred to the NEAR-GOOS Real Time Data Base.

The following data reports in International Code Forms (established by WMO) are used 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 bathythermograph 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 Data Base in the established international formats via internet by the data nodes/centers of member countries as well as by relevant organizations in Japan.

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

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

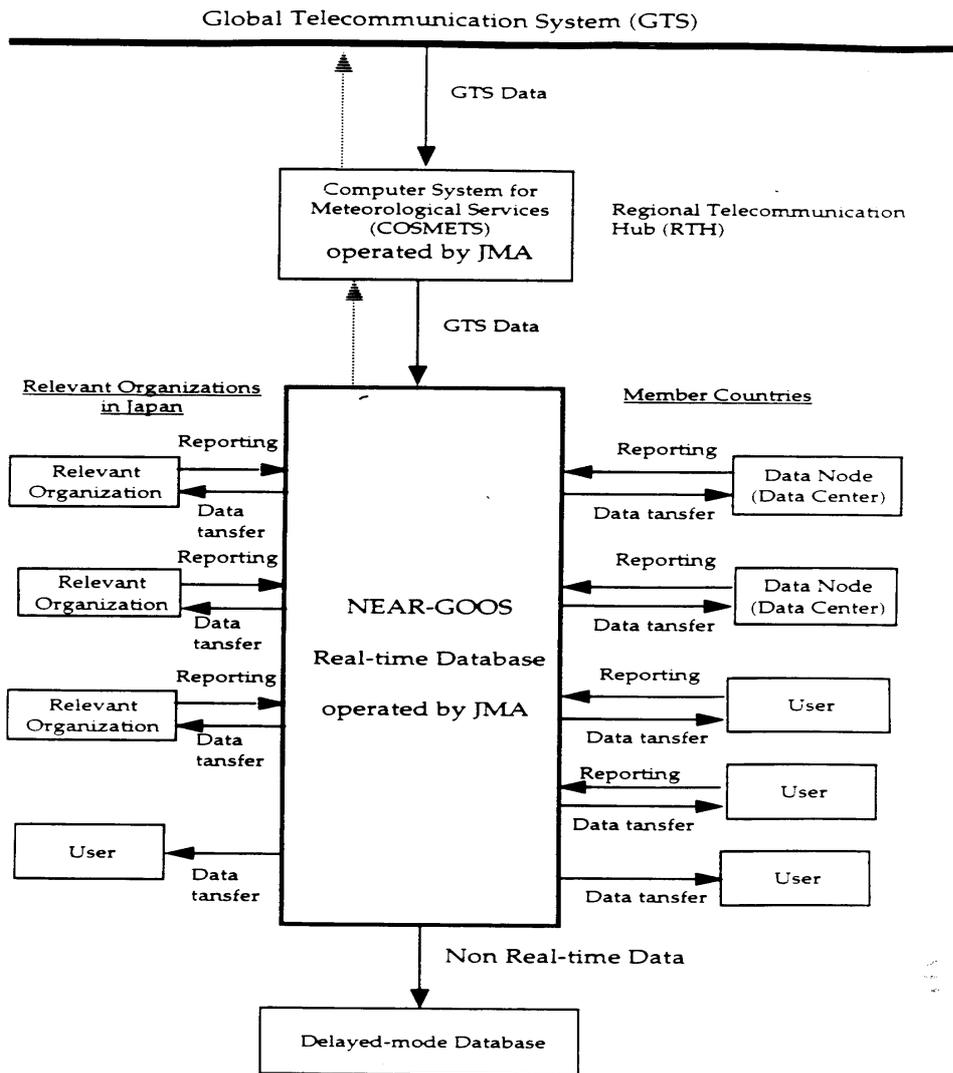


Fig. 1 NEAR-GOOS Real-time Database

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

*Japan Oceanographic Data Center, Maritime Safety Agency*

The Japan Oceanographic Data Center (JODC) is a National Oceanographic Data Center within the framework of the International Oceanographic Data and Information Exchange (IODE) sponsored by the IOC.

JODC serves as the Responsible National Oceanographic Data Center (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 can effectively 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 transferred to the JODC Data On-line Service System (J-DOSS), the data service system at JODC, in a batch mode for archiving as Continuously Managed Database (CMD) combined with the detailed data 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. Those interested in JODC may access information from the JODC Home Page over Internet. JODC's World Wide Web server has been established so that those accessing the JODC Home Page can easily retrieve not only information such as cruise inventories but also data itself. The Home Page is linked to the J-DOSS, which enables subscribers of the JODC Home Page to directly operate the Oracle-based J-DOSS Regional Data Base Management System.

## ANNEX VI

### **OPERATION MANUAL FOR THE NORTH-EAST ASIAN REGIONAL GOOS (NEAR-GOOS) DATA EXCHANGE (version 1.0)**

#### **1. INTRODUCTION**

As a regional pilot project of the Global Ocean Observing System (GOOS), the North-East Asian Regional GOOS (NEAR-GOOS) is being implemented by China, Japan, the Republic of Korea and the Russian Federation. NEAR-GOOS is intended to provide a regional framework for gathering, co-ordinating, and distributing oceanographic data in the North-East Asian region, in enabling participating countries to make better use of their investments in ocean observations and research towards the establishment the Global Ocean Observing System. Oceanographic data and relevant products generated within NEAR-GOOS system will be open at free cost through electronic communications for all forms of marine uses.

A draft Implementation Plan for the NEAR-GOOS was prepared by an *ad-hoc* Group and reviewed during the Expanded Experts Meeting for the NEAR-GOOS Implementation Plan. At the Third Session of the IOC Sub-Commission for the Western Pacific (Tokyo, Japan, 26 February - 1 March 1996), a decision was made on the establishment of a Co-ordinating Committee, composed of members nominated by the governments of four countries, to further develop the Implementation Plan and prepare an Operation Manual for NEAR-GOOS.

During the first session of the NEAR-GOOS Co-ordinating Committee (Bangkok, Thailand, 4-6 September 1996), the Committee adopted the Implementation Plan for the initial phase of the North-East Asian Regional GOOS (NEAR-GOOS). At the initial phase, two data bases, one Real Time Data Base for daily mapping of sea conditions, and the other Delayed Mode Data Base for archiving, are the essential function of the NEAR-GOOS. With generous contributions from the Japan Meteorological Agency (JMA) and the Japan Oceanographic Data Center (JODC), a draft Operation Manual for the data bases has been prepared and adopted by the First Meeting of the NEAR-GOOS Co-ordinating Committee.

This Operational Manual is subject to changes by the NEAR-GOOS Co-ordinating Committee. Such changes will be notified to all registered users, and the users should make use of the NEAR-GOOS data bases in accordance with the latest version of the Manual.

This Operational Manual can be read via the WWW server for user's reference.

#### **2. OPERATION OF THE NEAR-GOOS**

The NEAR-GOOS Co-ordinating Committee is established as a management body to further develop the Implementation Plan and Operation Manual as required, to monitor the operation of the system, to make necessary recommendations, to advise the participating countries on implementation of NEAR-GOOS and to report to the IOC/WESTPAC and I-GOOS as appropriate and required.

At the initial phase, observation and assessment of oceanographic data include temperature, salinity, current, wind and wave, which will come from oceanographic observations carried out by the participating countries, using moored buoys, drifting buoys, towers, coastal stations, research vessels, voluntary observation ships and remote sensing data, reported through GTS and Internet.

For effective transmission and exchange of the data in real time and near-real-time, a Real Time Data Base is created as a bin for on-line access by NEAR-GOOS users via Internet. The data in the data base will be kept for 30 days and then be transferred to the Delayed Mode Data Base, which is also established to collect, distribute and maintain the delayed mode data for the use

of NEAR-GOOS users.

The IOC Regional Secretariat for WESTPAC will provide necessary secretariat services for the operation of NEAR-GOOS.

### **3. MANAGEMENT OF NEAR-GOOS DATA BASES**

#### **3.1 MANAGEMENT OF THE DATA BASES**

The NEAR-GOOS data bases, namely Real Time Data Bases (RTDB), Delayed Mode Data Bases (DMDB), as well as Associate Data Bases (ADBs), are accessible, free of charge, to all users who are interested in obtaining the data and/or ready to contribute their data to the data bases. The Japan Meteorological Agency (JMA) and the Japan Oceanographic Data Center (JODC) are invited to host the RTDB and DMDB respectively. Expenses for computer and telecommunication system required to access the data bases should be covered by the users.

Participating countries may establish Associate Data Bases(s) to facilitate the data exchange. The organizations responsible for the Associate Data Bases should encourage users in their countries to make their data available to NEAR-GOOS.

Managers of the data bases should be assigned for the RTDB and DMDB in JMA and JODC respectively. Under the guidance of the NEAR-GOOS Co-ordinating Committee, particularly the NEAR-GOOS Co-ordinator, the Data Base Managers assume responsibility for the operation and management of the RTDB and DMDB, including data input to the data bases, registration of the users, monitoring of the RTDB and DMDB utilization, and provision of technical advice for further development of NEAR-GOOS data management, including data collection.

Managers of the data bases should submit their report periodically to the NEAR-GOOS Co-ordinating Committee on the operation of the data bases with suggestions on the further development.

Managers of the data bases will assume no responsibility whatsoever with regard to the use of the data bases and data. Nor will data base managers assume any responsibility for any consequences that may happen from interruption of data base services due to trouble with or maintenance of the data base servers or the related telecommunication circuit, etc.

#### **3.2 USER REGISTRATION**

The NEAR-GOOS data should be accessible, free of charge, to all users who are interested in obtaining data from and contributing data to the data bases. To ensure the security of the data bases and to maintain effective utilization of data base, registration is necessary.

Those who are willing to be registered users should submit the application form (Appendix 1) directly, or through the members of the Co-ordinating Committee in the country of applicant, as requested, to the NEAR-GOOS Co-ordinator with a commitment to respect the operational rules in its manual. Upon receiving the application, the NEAR-GOOS Co-ordinator will issue the authorization (Appendix 2), with the help of the WESTPAC Secretariat if necessary. A copy of the authorization to the applicant will be sent to the members of Co-ordinating Committee. Registered users can freely access and process the data obtained from the NEAR-GOOS data bases for their own oceanographic services and research. However, users are allowed to further forward the data to a third party, with or without charge, in the original form or in any other form facilitating the reproduction of the original data, only with the authorization of the NEAR-GOOS Co-ordinator.

More than one account name (see Appendix 1) can be issued for one organization or for one password holder of the organization. However, applications for the account names have to come only from the password holders identified in the application for access to the NEAR-GOOS data bases.

Registration may be nullified if the user do not fulfil the requirements.

### 3.3 NEAR-GOOS HOMEPAGE

As the main entry of the system, a NEAR-GOOS homepage will be established at the GOOS Support Office of IOC. The homepage will provide information on the development and operation of NEAR-GOOS as the news pages, and also provide guidance for accessing and contributing oceanographic data to the system. The GOOS Support Office of IOC is responsible for up-dating the homepage in co-operation with and contribution from the NEAR-GOOS Co-ordinating Committee. The current address of the homepage is <http://www.unesco.org/ioc/goos/neargoos.htm>.

However, in order to promote the exchange of oceanographic data, the homepages of the data bases will be developed by the respective servers, and include inventories of the data opened to the public.

## 4. TECHNICAL MANUAL

### 4.1 REAL TIME DATA BASE (RTDB)

#### 4.1.1 Introduction

Within the framework of NEAR-GOOS, the NEAR-GOOS Real Time Data Base (RTDB) has been established for exchanging oceanographic data on a real time basis for the oceanographic services and research. The RTDB collects the data exchanged over GTS, and those observed by the participating countries and collected through Internet, and makes them available to the users.

The Japan Meteorological Agency (JMA), which operates a Regional Telecommunication Hub (RTH) under GTS of the WMO and a Special Oceanographic Centre (SOC) in IOC/WMO Integrated Global Ocean Service System (IGOSS), assumes the responsibility of managing and operating the RTDB.

#### 4.1.2 Data Collection and Quality Control

The following data are available in the RTDB:

- (i) The oceanographic data within the NEAR-GOOS area collected through GTS in the WMO Codes.
  - SHIP
  - BUOY
  - TRACKOB
  - BATHY
  - TESAC
- (ii) Daily sea-surface temperature analysis by JMA
- (iii) Data observed by the participating countries and collected through Internet.

The GTS data are collected by the Computer System for Meteorological Services (COSMETS) of JMA which serves as a RTH under the GTS. The data are transferred from COSMETS to the RTDB every weekday (see Section 4.1.5).

The users of the RTDB are encouraged to contribute their data to the RTDB by transferring data files through Internet. These data are then made available to other users without modification. The data collected via Internet will be transferred to GTS for further distribution unless the providing organization requests RTDB manager to not do so for a clearly stated reason.

The data in the RTDB will be transferred to the Delayed Mode Data Base operated by the Japan Oceanographic Data Centre, after 30 days received by the RTDB.

The RTDB eliminates the exact duplication of GTS reports within a file (see Section 4.1.4). It should be noted that more than one report of an observation at the same location and at the same time may be left in a file if the contents of the reports are not exactly the same.

No quality control is applied for the moment. The policy and method of the quality control should be determined by the NEAR-GOOS Co-ordinating Committee in future, considering the purpose of the data usage by various users. The QA/QC procedure will be further studied by the participating countries and the Co-ordinating Committee based on the experience obtained from the operation of the system.

#### **4.1.3 Data Base Service**

##### *Computer requirement*

A workstation or other computer connected to Internet is required for the data retrieval from and contribution to the RTDB. A software to support the file transfer protocol (ftp) communications is needed.

##### *Data Retrieval*

A user can retrieve data of the RTDB to their computer by ftp (see Appendix 4 for a sample UNIX command sequence). They are also able to retrieve the data using support tools of the RTDB WWW server such as the data list.

The RTDB server has a directory, /pub to contain all the oceanographic data of the RTDB. Under this directory are sub-directories, whose names indicate the name of the data format, such as "ship", "buoy", etc. Data are stored in files under these sub-directories. Each file has a name indicating the date of observation, the date of reception at the Tokyo RTH, as in the following examples:

/pub/ship/ship.obsJul20.rcvJul21

(the data of the observation made on 20 July which Tokyo RTH received during 24 hours until 0010 UTC, 21 July reported in the SHIP format)

/pub/jmaabc/jmaabc.obsJul20.jma.north

(the data of the observation made on 20 July reported in the user defined format, JMAABC (a fictitious format name))

/pub/sstanl/sstanl.obsJul20

(SST Analysis data on 20 July)

##### *Data formats*

Each file contains the data corresponding to the observation date and input date indicated by its name in the following format.

##### (i) GTS data

The data are stored in the character code according to the WMO Code, which will be available at the RTDB homepage. A file usually contains more than one reports corresponding to the observation date and input date indicated by the file name.

##### (ii) Non GTS data

The data are made available in the same format that is used by the original users. The explanation for the data formats should be available in the same sub-directories that contain the data as described in the following paragraphs.

The RTDB manager reviews the technical aspects of the format used in the NEAR-GOOS data bases, and, in consultation with the Co-ordinating Committee, develops formats used in NEAR-GOOS as necessary, to achieve user-friendly data exchange mechanism as much as possible.

#### *Contribution of data*

Users are expected to contribute oceanographic data to the extent possible for the promoting oceanographic data exchange. The RTDB manager prepares a directory with write permission for each user, and the user can send the data files via ftp (Annex 4 (3) for a sample UNIX command sequence) to this directory. Users can also contribute their data by putting them in their server which is accessible to RTDB manager via ftp. In this case, the same rules are applied to the names of files and other technical details, and the users have to keep close communication with the RTDB manager to ensure the smooth transmission of the data.

The data should be contributed in the WMO Code or in the format defined by the user. The RTDB manager transfers the data from the directory with write permission mentioned above to the directory that other users can access. The name of the format should be defined by the user consulting the RTDB manager, and the document on the format should be made available by sending it to the directory with write permission. The RTDB manager transfer this document to the directory for the access by other users. The data in the directory with write permission will be deleted as soon as transferred to the public directory. The name of the directory with write permission is the same as the account name of that user.

The files that the user transfers to the RTDB server should be named according to the following rule.

#### *Oceanographic data*

XXX.obsMMMDD.YYY.ZZZ,

where XXX is the format name ('ship', 'buoy', etc., for the WMO Codes, or the name of the user defined format), MMMDD indicates the observation date, YYY is a series of characters that the RTDB manager defines to specify the contributing institute, and ZZZ is used freely by each user to avoid the duplicated file names or other purposes.

Example: jmaabc.obsJul20.jma.north

The data of observation made on 20 July reported in the format, JMAABC (a fictitious format name), "jma" indicating the institute that contributed this data.

#### *Document of the user defined format*

XXX.doc

XXX is the name of the format. The file should be a text (ASCII) file.

Example: JMAABC.doc

#### *Password*

When a user accesses the RTDB, a password is needed for the security of the RTDB server. The user is encouraged to change their password regularly. The password can be changed by the user via telnet Annex 4 (5) for a sample UNIX command sequence). The telnet access by RTDB users has been prepared only for the password change, and it automatically logs out as soon as the password is changed.

### *Others*

The RTDB manager monitors the RTDB usage including the data retrieval and contribution by users, and report the monitoring results periodically to the NEAR-GOOS Co-ordinating Committee.

The notification from the RTDB manager to the users on the operational matters of the NEAR-GOOS RTDB, such as a plan for tentative service suspension for maintenance, is made by putting the notice in a news file accessible by all the users. The users can look at this file either via WWW server or via ftp. The file is also seen as the opening message of the ftp session. The RTDB manager sends the same content to the users by e-mail, but does not confirm the reception nor make re-transmission in case of communication failure.

#### **4.1.4 Operation of the RTDB server**

This section describes the operation of the RTDB server for the reference to the users. Minor changes may be made to the operation without notifying the users when the RTDB manager considers the changes do not affect the use of the RTDB.

##### (i) COSMETS and the RTDB Server

JMA operates the Computer System for Meteorological Services (COSMETS) for the collection, processing and distribution of the meteorological data. The system consists of an on-line system (Central Automated Data Editing and Switching System (C-ADESS)) for meteorological telecommunication and a batch system (Numerical Analysis and Prediction System (NAPS)) for meteorological data processing. The C-ADESS serves as a RTH in the GTS to exchange data with other national Meteorological Services. C-ADESS exchanges meteorological data with other related centres as well. The data collected by the C-ADESS are passed to the NAPS where they are processed for various JMA services such as numerical weather prediction and oceanographic services.

Since currently there is no on-line link between the COSMETS and the RTDB server for security reasons, the oceanographic data are transferred manually using magnetic optical disks from the COSMETS to the RTDB server. JMA has a plan to have a highly secured on-line link between the two systems, and when they are connected, the data transfer will be done automatically every day including holidays.

##### (ii) Reliability

The RTDB server is composed of two workstations sharing a highly reliable hard disk system and operates on a 24 hour basis. The two workstations are identical and back up each other to enhance the reliability of the RTDB server. However, software troubles common to both workstations, including troubles in the backup function itself and other troubles may cause unexpected suspension of the RTDB services. In these cases, the RTDB manager will make every effort to resume the RTDB function as soon as possible, though the measures are usually taken within the normal working hours. It should be noted that the RTDB is not under continuous watch and it may cause some delay in the detection of the troubles.

#### **4.2 NEAR-GOOS DELAYED MODE DATA BASE**

After 30 days, the data will be transferred from RTDB to the Delayed Mode Data Base (DMDB) and this section prescribes the DMDB operation method.

##### **4.2.1 Available data**

##### (1) Data available through RTDB (transferred to DMDB 30 days after they were received by RTDB)

- (i) Following data obtained through WMO report system: SHIP, BUOY, TRACKOB, BATHY, TESAC;

- (ii) Daily water temperature at the surface of the sea;
  - (iii) Data reported to RTDB from participating institutions of NEAR-GOOS via Internet;
- (2) Data directly sent to DMDB

Detailed oceanographic data, such as temperature and salinity at every 2 db from CTD casts and records of moored current meters, etc.

#### **4.2.2 Structure of DMDB**

DMDB shall be controlled by NEAR-GOOS directory in WWW server (J-DOSS) operated by JODC. Data transferred to DMDB from RTDB after a lapse of 30 days shall be listed in DMDB every month. Data shall be brought together for each data item in one file per month according to the dates on which they were received. Data such as SHIP, BUOY, TRACKOB, BATHY and TESAC shall be brought together in a file every month and stored in DMDB in chronological order in each file name. The format of each data shall be basically the same as the format of RTDB data, and the components shall not be edited. Files shall be identified by file names, examples of which are given below:

1996\_07.bathy: Bathy data RTDB received in July 1996  
1996\_07.buoy: Buoy data RTDB received in July 1996  
1996\_07.ship: Ship data RTDB received in July 1996  
1996\_07.tesac: Tesac data RTDB received in July 1996  
1996\_07.trackob: Trackob data RTDB received in July 1996

#### **4.2.3 How to use DMDB**

A browser that provides interface to WWW operating on Internet is required to obtain data stored in DMDB. To access data, users can login the WWW server of JODC from their own computers linked to Internet, and transfer data to users' computers using the file transfer function of the WWW browser.

Notices to users from the Manager regarding the operation of DMDB such as temporary suspension of service, etc. shall be, in principle, made in the form of announcement in the notice file provided on J-DOSS.

**Appendix 1 to Annex VI**

**Form of Application for Access to the NEAR-GOOS Data Base**

(Date, Place)

For the attention of  
the NEAR-GOOS Co-ordinator

I apply for access to the NEAR-GOOS Data Base.

1. Name of the organization
2. Address of the organization
3. Purpose of the use of the Data Base
4. Names of password holders authorized to apply for account in the Data Base
5. Oceanographic Data at the organization
6. The data out of the answer to 5. that will be exchanged through the Data Base.

Once authorized, I shall use the Data Base according to the NEAR-GOOS Operational Manual.

SIGNATURE

(Director of the Organization)

cc: NEAR-GOOS Real Time Data Base Manager  
NEAR-GOOS Delayed Mode Data Base Manager  
IOC Regional Secretariat for WESTPAC

**Appendix 2 to Annex VI**

**Letter of Acceptance for Access to the NEAR-GOOS Data Base**

(Date, Place)

For the attention of  
the Director of Organization

I am pleased to inform you that your application for the access to the NEAR-GOOS Data Base has been accepted. You are authorized to use the Data Base according to the Operational Manual.

For the access to RTDB and DMDB, you should contact the data bases managers of RTDB and/or DMDB in the form shown in Appendix 3, a copy of which is attached. IP address of the user's computer, account name, password and other necessary technical information should be specified in the form. You should send the form together with a copy of this letter of acceptance to the managers of the data bases, by post, not by e-mail, considering the security. You will receive a notification from the managers.

SIGNATURE

NEAR-GOOS Co-ordinator

cc: NEAR-GOOS Real Time Data Base Manager  
NEAR-GOOS Delayed Mode Data Base Manager  
Members of the Co-ordinating Committee from applicant's country

**Appendix 3 to Annex VI.**

**Form of the Request for the Registration**

Date, Place

For the attention of  
the NEAR-GOOS Data Base Manager

I request for the registration of my organization at the NEAR-GOOS Data Base. The required technical information is as follows. Attached to this letter is a copy of the Letter of Acceptance of Access to the NEAR-GOOS Data Base.

1. Name of organization and country
2. Contact person
3. E-mail address of the contact person (the completion of the registration will be notified to the contact person at this address)
4. IP address of the computer for the access to the Data Base
5. Account name
6. Password
7. Type of computer and operational system used for the access
8. Expected amount of the data per month that are transmitted to the data base (in kilobyte)

SIGNATURE



```
ftp> cd /pub/ship (cd /pub/buoy for buoy data, etc.)
250 CWD command successful.
ftp>
ftp> as (When you retrieve a binary file, type "bi")
200 Type set to A.
ftp> get ship.obsDay14.rcvJul15
200 PORT command successful (translated to PASV by DeleGate).
150 Opening ASCII mode data connection for ship.obsDay14.rcvJul15 (751627 bytes).
226 Transfer complete.
local: ship.obsDay14.rcvJul15 remote: ship.obsDay14.rcvJul15
767460 bytes received in 4.4 seconds (1.7e+02 Kbytes/s)
```

(2-2) To get more than one files using a wild card (to get all the ship data of the observation made on the 13th day of the month for example)

```
ftp> cd /pub/ship (cd /pub/buoy for buoy data, etc.)
250 CWD command successful.
ftp> as (When you retrieve a binary file, type "bi")
200 Type set to A.
ftp> mget ship.obsDay13.*
mget ship.obsDay13.rcvJul13? y
200 PORT command successful (translated to PASV by DeleGate).
150 Opening ASCII mode data connection for ship.obsDay13.rcvJul13 (6107 bytes).
226 Transfer complete.
local: ship.obsDay13.rcvJul13 remote: ship.obsDay13.rcvJul13
6237 bytes received in 0.15 seconds (42 Kbytes/s)
mget ship.obsDay13.rcvJul14? y
200 PORT command successful (translated to PASV by DeleGate).
150 Opening ASCII mode data connection for ship.obsDay13.rcvJul14 (760709 bytes).
226 Transfer complete.
local: ship.obsDay13.rcvJul14 remote: ship.obsDay13.rcvJul14
776776 bytes received in 4.8 seconds (1.6e+02 Kbytes/s)
mget ship.obsDay13.rcvJul15? y
200 PORT command successful (translated to PASV by DeleGate).
150 Opening ASCII mode data connection for ship.obsDay13.rcvJul15 (10091 bytes).
226 Transfer complete.
local: ship.obsDay13.rcvJul15 remote: ship.obsDay13.rcvJul15
10302 bytes received in 0.07 seconds (1.4e+02 Kbytes/s)
```

(3) To send data

Change the current directory of your computer to the directory bearing the files to be transmitted before you start ftp.

When you start the ftp, your current directory (in the Data Base server) is the directory with write permission to which you can send files. If you have changed the current directory, use 'cd' to change the current directory to the directory with write permission (the name of directory is the same as your account name) before you start the following sequence.

(3-1) To send a text file (jmaabc.obsJul20.jma.north, for example)

```
ftp> as
200 Type set to A.
ftp> put jmaabc.obsJul20.jma.north
200 PORT command successful.
150 Opening ASCII mode data connection for jmaabc.obsJul20.jma.north.
226 Transfer complete.
```

local: jmaabc.obsJul20.jma.north remote: jmaabc.obsJul20.jma.north  
12 bytes sent in 0.00093 seconds (13 Kbytes/s)  
ftp>

(3-2) To send a binary file (jmaxyz.obsAug10.jma.sample, for example)  
ftp> **bi**  
200 Type set to I.  
ftp> <B>**put jmaxyz.obsAug10.jma.sample**  
200 PORT command successful.  
150 Opening BINARY mode data connection for jmaxyz.obsAug10.jma.sample.  
226 Transfer complete.  
local: jmaxyz.obsAug10.jma.sample remote: jmaxyz.obsAug10.jma.sample  
11 bytes sent in 0.00027 seconds (40 Kbytes/s)

(3-3) To send more than one files using wild card (all the files whose name start with 'jmaxyz.', for example, in the current directory of your computer)

ftp> **mput jmaxyz.\***  
mput jmaxyz.obsAug10.jma.sample1? **y**  
200 PORT command successful.  
150 Opening BINARY mode data connection for jmaxyz.obsAug10.jma.sample1.  
226 Transfer complete.  
local: jmaxyz.obsAug10.jma.sample1 remote: jmaxyz.obsAug10.jma.sample1  
11 bytes sent in 0.00027 seconds (40 Kbytes/s)  
mput jmaxyz.obsAug10.jma.sample2? **y**  
200 PORT command successful.  
150 Opening BINARY mode data connection for jmaxyz.obsAug10.jma.sample2.  
226 Transfer complete.  
local: jmaxyz.obsAug10.jma.sample2 remote: jmaxyz.obsAug10.jma.sample2  
11 bytes sent in 0.00021 seconds (52 Kbytes/s)  
ftp>

(4) To finish ftp

ftp> **bye**  
test@cc:~ \$

(5) To change your password

test@cc:~ \$ **telnet goos.kishou.go.jp**  
Trying 172.17.253.253 ...  
Connected to goos.kishou.go.jp  
Escape character is '^'].

SunOS UNIX

login: **jmauser**  
Password:(**enter your current password**)  
Last login: Mon Jun 3 16:17:24 from goosb  
SunOS Release 4.1.3-JLE1.1.3\_U1 (BQE\_HA-MO) #1: Fri May 10 12:23:32 JST 1996  
Changing password for jmauser on goosa.  
Old password: (**enter your old password.**)  
(Password is not shown on the display  
New password:(**enter your new password.**)  
Retype new password:(retype your new password for confirmation)  
Connection closed by foreign host.  
test@cc:~ \$

(END OF DOCUMENT)