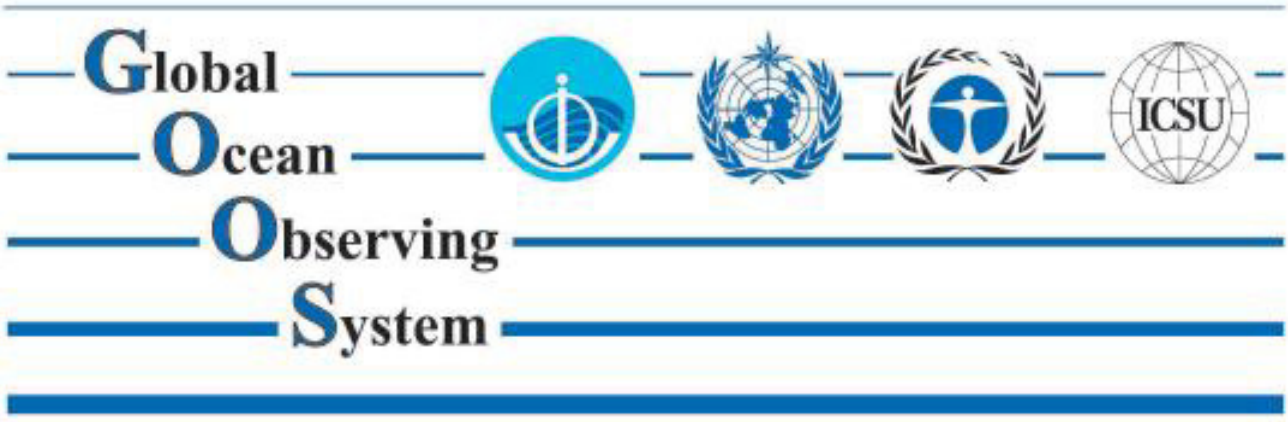

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

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

Sixth Session
Seoul, Republic of Korea
31 August 2001

GOOS Report No. 120

UNESCO

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IOC/WESTPAC-NEAR-GOOS-CC-VI/3
Paris, March 2002
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Abstract
The Sixth Session of the NEAR-GOOS Coordinating Committee was held in Seoul, Republic of Korea, 31 August 2001. The meeting was held back-to-back to an expert workshop on NEAR-GOOS Ocean Environment Forecasting. The main objective of the Session was to discuss the progress on the elaboration of a medium-term strategy plan for NEAR-GOOS and seek a workable mechanism to support the process. To this end, the Coordinating Committee agreed to: (i) the establishment of two working groups charged with the elaboration of detailed and comprehensive project documents that highlight concrete steps toward establishing an observation and data management capacity, and an data assimilation, modelling and forecasting capacity respectively; (ii) to set in motion a parallel process to draw up a strategic plan that will build on the discussion paper discussed at the previous CC-meeting; and (iii) partly as a result of the preceding workshop, a consensus to enlist the support of interested scientists to elaborate specific fundable proposals for pertinent elements of a NEAR-GOOS initial observing system. The Session also discussed the general progress achieved under NEAR-GOOS in each of the countries over the past intersessional period.

TABLE OF CONTENTS

1. OPENING

1 The Chairperson, Dr. Dong-young Lee opened the Sixth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS) at 09:15 hours on Friday 31 August 2001, at the SNU Hoam Faculty House Convention Centre in Seoul, Republic of Korea. He welcomed all the participants, including the observers from PICES and other organizations, and expressed his appreciation to the Korean Ministry of Maritime Affairs and Fisheries for hosting both the meeting and the preceding NEAR-GOOS Ocean Environment Forecasting Workshop. The list of participants is given as Annex II.

2 The Chairperson of the IOC Sub-Commission for the Western Pacific, Prof. Keisuke Taira followed with a short overview of recent developments in NEAR-GOOS as well as challenges faced in operational oceanography, making an analogy to the development of a global weather forecasting system that started some 40 years ago. Progress is required on two fronts, both on the research side as well as on the operational side. He noted with satisfaction the initiation of SEAGOOS in the Southeast Asian region. He thanked on behalf of the Executive Secretary of the IOC, Dr. Patricio Bernal, Mr. Young-Suk Kim and his staff for organising the meeting. Finally, he thanked the Secretariat and Chairperson for all the preparatory work.

3 Mr. Young-Suk Kim, Director of the Marine Development Division of the Marine Policy Bureau of MOMAF concluded the opening session. He alluded to the fact that NEAR-GOOS finds itself at a juncture where important decisions need to be made with regard to its future direction in the field of operational oceanography. The Ministry of Maritime Affairs and Fisheries has drawn up a master plan for the integrated monitoring of Korean waters and is supporting different research projects that underpin its development. He thanked the Secretariat and concluded his address by wishing the participants fruitful progress in the development of the strategic plan for the next phase of NEAR-GOOS.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF AGENDA

4 The Chairperson introduced the Provisional Agenda that was subsequently adopted by the Committee with minor modifications. The Agenda is attached as Annex I.

2.2 DESIGNATION OF RAPPORTEUR

5 The Delegate of China nominated Dr. Vyacheslav Lobanov as the Rapporteur and the meeting accepted this proposal. Dr. Lobanov was designated as the Rapporteur.

2.3 WORKING ARRANGEMENTS

6 The Technical Secretary, Mr. Maarten Kuijper, informed the meeting about 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. STATUS OF NEAR-GOOS: REPORT ON THE OPERATION

3.1 REPORT BY THE CHAIRPERSON

7 The Chairperson reviewed the progress made in NEAR-GOOS since the Fifth Session of the Committee, noting that only eight months had passed since the previous session. Over these months, a lot of effort was devoted to the organization of the NEAR-GOOS Ocean Environment Forecasting Workshop that preceded the present meeting. The workshop took the form of two days of presentation and one day of discussion. 40 papers were presented, 7 of which were from China, 12 from Japan, 15 from the Republic of Korea, 2 from the Russian Federation and finally 4 by scientists from non-member states. The workshop provided a comprehensive overview of the current research developments in each of the countries. It also showed that researchers were keen to participate in and contribute to the NEAR-GOOS initiative.

8 Dr. Lee further expressed his desire that the Democratic People's Republic of Korea considers participating in future meetings of NEAR-GOOS, possibly first as observer and eventually as member state. In response, the Technical Secretary explained that DPR Korea was invited to the present meeting and the workshop. Moreover, from conversations with the Deputy Permanent Representative of the DPR Korea to UNESCO, the picture emerged that the marine science community in that country is indeed interested in NEAR-GOOS, but initially would benefit most from participating in capacity building activities. The Commission was informed that the IOC would issue an invitation to the DPR Korea to attend the Fifth Session of the IOC/WESTPAC Sub-Commission at its meeting in Perth, Western Australia, 2002.

9 The Chairperson further noted the continued development of NEAR-GOOS as a significant contribution toward the establishment of GOOS at a global scale. Mr. Hasegawa and Prof. Yu participated in the GOOS Steering Committee meeting held in March 2001 in Chile, and Prof. Yu also represented China in the first meeting of the joint IOC-WMO Commission for Oceanography and Marine Meteorology (J-COMM) in Iceland, June 2001. The Technical Secretary participated in the I-GOOS meeting held in June 2001, France.

3.2 REPORT BY THE TECHNICAL SECRETARY

10 The Technical Secretary informed the meeting on activities carried out by the Secretariat. He mentioned again his conversations with the representative of the DPR Korea at the time of the General Assembly held in Paris, July 2001. He then expressed his concerns with the elaboration of the strategic action plan, emphasising on the need that all CC-members as well as other interested parties should take an active role in the process. The present meeting should identify a mechanism by which the strategic plan can be drawn up and through which the members and other parties can best contribute to the process. As a starting point he invited the meeting to briefly review the implementation of actions contained in the action list adopted by the Fifth Session of the Committee and reiterate those actions that require follow-up. Actions relevant to the strategic planning exercise will be taken into consideration under Agenda Item 4.

Review of Action List of CC-5

11 With respect to GODAR, Mr. Satoshi Sato informed the meeting that as a result of the International Conference on IODE in the Western Pacific held in 1999 in Langkawi, Malaysia, a programme for WESTPAC-GODAR was established, that called on countries to contribute and rescue historical data sets. So far, however, the response from countries other than Japan has been minimal. A problem is the fact that many countries in the WESTPAC region lack a properly

functioning National Oceanographic Data Centre, and that the plans for the implementation of a regional GODAR programme are not concrete yet.

12 Prof. Yu distributed an English summary report of the national GOOS data user workshop held in China in June 2000, that he was requested to provide at the previous CC-meeting. The summary is contained in the Country Report of China (Annex IV.3). He further informed the meeting that through consultation with the relevant authorities, he would continue his efforts to broaden data exchange and collaboration among different government agencies within China.

13 Further to the proposed inclusion of ONR-funded research data (in particular those derived from the deployment of Palace floats) in the region, Dr. Taira mentioned that in principle such data should be available as was agreed at the start of the research programme. Dr. Lobanov suggested that the Technical Secretary contact the responsible chief investigators (Dr. Lynne Taylor and Dr. Steve Ryser) in order to discuss ways of having the data become available to the NEAR-GOOS community.

14 From the discussion, it further became apparent that Argo floats are most likely to be deployed on the Pacific side of Japan, and not in the NEAR-GOOS area. Some 400 floats are currently deployed worldwide.

15 The Technical Secretary informed the meeting about the completion of the strategic design plans for the various GOOS modules. These will be distributed to each of the members as soon as they are printed.

16 With reference to the action item on GLOSS, Dr. Lobanov reported that under a national initiative efforts are underway to upgrade sea-level gauge stations along the far-eastern coastline.

17 Mr. Sato reported that the JODC, as the JGOFS Data Management Office of Japan, had published the CD-Rom datasets of NOPACCS (North Pacific Carbon Cycle Study) in cooperation with the organizations that had participated in the project. The data is also available on the website: http://www.kanso.co.jp/ocean/ .

18 Dr. Lee urged members to encourage data providers and processors to make their respective data more readily available. In the Republic of Korea, efforts are underway to obtain the data from tidal stations in real-time making them useful for fisheries oceanography.

3.3 REPORT ON REGIONAL DATA BASE MANAGEMENT

3.3.1 Regional Real Time Data Base

19 Mr. Hasegawa, the RRTDB Manager presented a report on the operation and activities related to RRTDB during the last intersessional period. He noted in particular the increase in volume of data and number of users. He explained that the FTP-put mode would become unavailable in autumn 2001 except for the users who actually use the mode. The report is attached as annex IV.1.

20 The Committee took note of the information provided. In response to a question, Mr. Hasegawa explained that data from the Palace Floats are automatically uploaded in the RRTDB in TESAC code via the GTS.

3.3.2 Regional Delayed Mode Data Base

21 The chairperson welcomed Mr. Sato as new CC-member replacing Mr. Toshio Nagai of JODC. Mr. Sato, as Deputy Director of JODC took over the job of RDMDB manager at JODC and will represent this agency in future CC-meetings. He presented a report on the operation and activities related to RDMDB during the last intersessional period. The report is attached as Annex IV.2.

22 The Committee welcomed Mr. Sato to the Committee and took note of the information provided.

3.4 REPORT ON DATA MANAGEMENT TRAINING COURSE

23 Mr. Sato subsequently presented a report on the course programme of the Fifth Training Course that will be held from 5 November to 16 December 2001 and for which the circular letter had already been issued. In response to the discussion held at the Fifth Meeting of the Coordinating Committee in the previous year, ODC had revised its course programme and introduced a lecture item on the IODE Resource Kit. Mr. Greg Reed was invited to lecture at the November training. He further reported that JODC would consider the possible inclusion of a lecture on biological and chemical data management in future course programmes.

24 The Chairperson argued that participants from DPR Korea should be given a chance to attend the training course if they apply. The Technical Secretary understood the need to engage DPR Korea, but participation in the training course should also be evaluated on the basis of the quality of applicants and number of seats available. This is all the more true if the country in question insists that not just one but two trainees of that country participate.

3.5 REPORT ON NATIONAL ACTIVITIES

25 For reasons of time, the Technical Secretary reminded the CC-members that country reports should be provided in written form only. These are annexed in Annex IV.3. For an overview of national activities in Japan, the representative referred to the summaries provided on the operation and activities related to the regional databases as presented in Annex IV.1 and IV.2 respectively.

4. MEDIUM TERM NEAR-GOOS STRATEGY PLAN

4.1 SCOPE AND NATURE OF STRATEGY PLAN

26 The Technical Secretary informed the Committee about the discussion paper of the medium-term strategy plan and suggested to use this as a guideline for the present discussion. Moreover, he suggested to the meeting to consider the outcome of NEAR-GOOS Ocean Environment Forecasting Workshop as input to this Medium Term NEAR-GOOS Strategy Plan.

27 He further emphasized that any direction in the proposed medium-term strategic plan should provide the basis for work and underpinning research in each of the countries to ensure: (i) the effective integration and strengthening of the data monitoring and data flow activities; (ii) the inclusion of additional parameters (including chemical and biological parameters); (iii) and an improvement of quality assurance and control procedures; and finally (iv) the provision of a range of forecasting tools and other value-adding products and services.

4.2 DATA GATHERING: FILLING IN THE GAPS

28 The Technical Secretary highlighted the need to consider three elements, namely the inclusion of additional parameters, the geographic scope and the implications of new data gathering technologies in the discussion of the strategic action plan. He suggested that one of the ways to go forward was an appraisal of model needs in the region. Many sophisticated models are in use nowadays that require large data sets of a wide range of input variables. The question is whether NEAR-GOOS can or indeed should cater for all these data sets, or whether a more pragmatic approach can be followed that is driven by the proven application of models or datasets that have the potential to be used in an operational manner on a day-to-day basis.

29 The Chairperson added that over the last seven years many things have changed. Different remote sensing data have become available, including ocean colour, and there is a better understanding of marine environment and ecosystem dynamics that has led to more complex prediction models. In this regard, ocean circulation and environmental data must be considered a priority in a second phase of NEAR-GOOS. Moreover, highlighting tide gauges as an example, he reiterated the desire that currently produced data should become available in a more timely fashion, preferably in real-time whenever possible.

30 Dr. Lee further added another issue for the Committee to consider. He referred to the comparative strength of NEAR-GOOS in forging regional cooperation as opposed to efforts that can be dealt with at the national level, and in this respect invited the meeting to consider the possibility of establishing collaborative programmes for data collection, such as ferry boxes or jointly operated buoys or drifter programmes. The deployment of offshore monitoring platforms or buoys is expensive, yet necessary if we wish to groundtruth remote sensing applications, and calibrate and validate many models. Such types of observations could well be implemented as joint-collaborative programmes in which the countries share in the cost and burden for the operation of the platforms. The initiation of collaborative offshore ocean data gathering programmes through the cooperation of the participating countries could form an essential contribution to GOOS.

31 He basically foresaw two possible roles for NEAR-GOOS. At the national level, he saw a role for NEAR-GOOS in the provision of guidelines and advice, whereas at the regional level he would like to see more focus on actually establishing and maintaining collaboration in building a regional ocean observing system.

32 Prof. Yu suggested that NEAR-GOOS should focus on determining what concrete steps can be undertaken in order to arrive at a marine environmental forecasting capability in the region. This was the original concept for the workshop as proposed by Prof. Su Jilan, programme coordinator of the IOC/WESTPAC Ocean Dynamics and Climate programme at the time of the Fourth Session of the WESTPAC Sub-Commission in March 1999.

33 The Chairperson reviewed the achievements of the workshop, in particular, highlighting the fact that in the last day of the workshop the participants had set themselves the goal of coming up with a concrete action plan in the respective fields considered, those being: wave and sea state forecasting, circulation and water quality and ecosystem modelling.

34 Dr. Kawamura explained the GODAE project. This project aims at demonstrating operational oceanography in the global ocean. The expectation is that from 2003-2005, when Argo has a much wider coverage, many data will become available. Prior to that emphasis is on preparation. At present, our knowledge of SST is limited, partly because cloud cover prevents

satellites from measuring it. NEAR-GOOS might consider linking up to the GODAE project as one of the pilot demonstration sites.

35 Another observation made by Dr. Kawamura concerned the limitations of remote sensing applications in the field of operational oceanography. Current sensors are insufficient to provide comprehensive coverage. Moreover, there is a need for some kind of mechanism by which the all the different data can be delivered to the oceanographic community. In this regard, it is important that the oceanographic modelling community specifies what they want from the remote sensing community.

36 Drawing on the foregoing, the chairperson referred to the priority questions that the NEAR-GOOS meeting needs to consider, contemplating first on the question of what type of operational forecasting capacity the committee wishes to prioritise under NEAR-GOOS, e.g.:

- Wave forecasting where individual member states have already made much progress, achieving real-time operational oceanography with input from meteorological data, or;
- Circulation modelling and forecasting, which is still largely in a research phase, and where there is a definite need for more and especially good data sets from across the region; or
- Ecosystem modelling, of which the development has just started.
- Important considerations in conducting this prioritisation are the ultimate use of the product, and the ways by which the NEAR-GOOS community can obtain and deliver good data sets.

37 A discussion ensued on the question whether NEAR-GOOS should focus on the delivery of forecasting products or on the delivery of good data sets. Several observers indicated a preference for forecasting products referring to the need for forecasts in the region, and the advent of remote sensing applications that will minimize expenses on data collection on the ground. Moreover, data exchange has already been adequately established. The question remains however through what mechanism such a capacity is generated.

38 The chairperson proposed to establish separate working groups composed of experts in respective fields that could assist the strategic planning exercise by preparing detailed plans and proposals for particular aspects of the observing system, e.g. ferry boxes, remote sensing or data management. The function of the working group is that of a driving force which will also help in securing funding support for such proposals once submitted to different funding agencies in each of the countries concerned. The experts that would participate in the working groups would volunteer their time and expertise to the process, simply because it is in their academic interest to do so. In this respect, the NEAR-GOOS strategic plan should provide the overall framework and is best drawn up by the committee members, and should focus on what can be achieved within 5-10 years. Referring to the outcome of the NEAR-GOOS Ocean Environment Forecasting Workshop, he suggested that the Committee draws up a list possible experts that might be asked to participate and possibly lead the working groups.

39 Several participants requested an explanation of what the specific task of the CC-members was, noting that it is the Committee members who should principally speak to the respective governments, and give appropriate advice as to what is needed, and what should be improved. To this end, Dr. Wang Hong argued that it was pertinent to establish the objective of the NEAR-GOOS strategic planning exercise first. The representative of PICES, Dr. McKinnell, referring to the discussion paper, argued that the objective of NEAR-GOOS has since long been established, but

that it is more important to consider how to achieve the objective.

40 The Chairperson summarized the main objectives of NEAR-GOOS as the need to achieve conservation and management of the marine environment, and its resources, and to facilitate disaster prevention. To this end, he would like to see an ocean circulation modelling and prediction capacity established that is crucial if the objectives of NEAR-GOOS are to be met. He further argued that NEAR-GOOS should focus on some useful products that will improve our understanding of ocean circulation, with the required coordination as the key function and strength of NEAR-GOOS. In the field of wave forecasting there is not necessarily a need for NEAR-GOOS as such capacity is already available, e.g. JMA is already conducting wave forecasting on an operational basis in Japan. The strength of NEAR-GOOS is in the coordination of efforts concerning problems that cannot be solved by one country alone.

41 Mr. Hasegawa suggested that in considering the objectives, the Committee should limit itself in what it wants to achieve in the next five years. This might vary from the delivery of data assimilation output or convincing data holders to release data sets from new platforms, including satellite applications, to working towards an environmental modelling capacity. Although these developments are not yet operational, NEAR-GOOS might assist in the development through the provision of good data sets needed to validate the models. He expressed his concern however that the development of an operational environmental modelling capacity will not be feasible within five years.

42 In response, the Chairperson drew the attention of the meeting to the fact that technology is developing very fast, and that having better data sets is within reach. But at present NEAR-GOOS has not yet established data exchange in real-time, and one of the priorities of NEAR-GOOS might be to coordinate so that datasets do become available in real-time. He further added that NEAR-GOOS itself does not have any money, and that the most it can do is coordination and invite experts to join the NEAR-GOOS community and have them contribute by writing specific research proposals. In order to appeal to such scientists, NEAR-GOOS needs to be ambitious in what it attempts to achieve. This led Dr. Im-sang Oh to conclude that NEAR-GOOS basically pursues two different objectives, (i) data exchange, currently the focus of the NEAR-GOOS CC, and (ii) prediction, which might be the focus of attention of the working groups.

43 In the following discussion, members argued about how best to advance the idea of having separate working groups elaborate concrete and realistic plans in two specific areas, namely (i) data collection and management, and (ii) application, forecasting and prediction. The Technical Secretary suggested that NEAR-GOOS members take the lead in these working groups in order to ensure an appropriate linkage to the strategic plan that will need to be prepared by the committee members. The strategic plan should provide the overall framework that will persuade governments to take a more active role in NEAR-GOOS. The working groups should moreover incorporate and readily draw on the goodwill of interested scientists who through the preceding workshop and through correspondence with the Chairperson have already committed themselves to collaborate, particularly where they, in parallel with the efforts of the CC-members in formulating a strategic plan, can assist in the elaboration of fundable proposals for relevant research. Both Dr. Kawamura and Dr. Lee referred to the need to have ample interaction between the two working groups, and it was agreed that the data collection working group would listen carefully to the data needs as expressed by the forecasting working group, in other words product and user-driven.

44 In recognition of the little time remaining and acknowledging the fact that the prior discussion had largely superseded the official agenda items under 4, the meeting split up into two sessional drafting groups charged with elaborating a preliminary outline of the workplan for each of

the proposed working groups, with particular emphasis on (i) the establishment of a realistic time frame, (ii) a listing of the basic elements of a terms of reference, (iii) a prioritisation of the issues and consideration of the overall goal and objectives, and (iv) a listing of concrete actions and activities that need to be undertaken. The Chairperson further implored to the meeting to set ambitious goals for each of the working groups. After one hour of discussions the sessional drafting group were requested to reconvene for a plenary review of the findings and closure of the meeting.

45 The Chairperson, Dr. Lee, delivered the report of the first group of participants, comprising Dr. Dong-young Lee, Dr. Vyacheslav Lobanov, Mr. Satoshi Sato, Dr. Hee-dong Jeong, Dr. Evgeny Karasev, Dr. Wang Hong, and Mr. Tsuyoshi Shiota. The groups findings were as follows:

Title of working group:
Observations and Data Management

Coordinator:
Dong-young Lee

Objectives:
To formulate specific and realistic goals that can be achieved in maintaining and developing a regional ocean observing system for the North East Asia Region.
First 5 years: Establish initial NEAR-GOOS Ocean Observing System.
5-10 years: Development of NEAR-GOOS Observing System.

Time frame:
Set 2001- Jan. 2002

- Preparation of a Brief Draft of the Strategy Plan to start to work with by the Working Group Coordinator.
- Revision of the Draft by the ad Working Group.

Feb. - May 2002

- Formation of advisory groups.
- Detailed Specific Proposal by the advisory groups for each item following the guidance of the Brief Draft.

June- September 2002

- Review of the specific proposal of each advisory group.
- Completion of the project plan.
- Adaptation and revision of specific proposals after proper revision.
- Preparation of the final document of the Working Group for the endorsement at next CC Meeting.

Actions and activities:
The group concluded that the following initial activities could be undertaken pending further discussion by the group members and facilitated by the coordinator, Dr. Dong-young Lee:

a. Formulation of Working Group and Advisory Groups
b. Survey of the present observing system of each country
c. Plan for making the existing non-real time data available to users
d. Preparation of specific and realistic regional data gathering programmes
e. Propose suggestions to the participating countries for the improvement of their national ocean observing system and data management arrangements
f. Preparation of the detailed implementation plan for the second phase of NEAR-GOOS

Terms of Reference
The Terms of Reference for the Ad Hoc Working Group is attached in Annex V. The Coordinating Committee agreed to adopt these Terms of Reference by correspondence following the Sixth Session of the Coordinating Committee.

46 On behalf of the second drafting group, composed of Prof. Yu Zhouwen, Naoyuki Hasegawa, Dr. Hiroshi Kawamura, Dr. Im Sang-Oh, Dr. Takashi Yoshida, Dr. Skip McKinnell and Maarten Kuijper, the latter summarized the groups findings as follows:

Title of working group:
Data Assimilation, Modelling and Forecasting.

Coordinator:
Takashi Yoshida

Objectives:
First 5 years: To establish projects that demonstrate the value of operational oceanography in the NEAR-GOOS region
5-10 years: To develop an operational capability in the NEAR-GOOS region.

Specific considerations:
Recognizing the comparative strength of NEAR-GOOS in regional coordination, NEAR-GOOS should initially focus on basin-scale circulation models for the marginal seas of the NEAR-GOOS region, with contributions from each member state. The time scale of forecasting will depend on what is realistically feasible.

Initial Time frame:
The first three months will be devoted to the preparation of a rough outline of the proposed project. In the next three months, comments and commitment will be solicited from a wider group of experts and agencies. In the following quarter, comments on the project document will be combined and a final plan produced for the endorsement by the respective governments at the next CC-meeting.

Terms of Reference
The Terms of Reference for the Ad Hoc Working Group is attached in Annex V. The Coordinating Committee agreed to adopt these Terms of Reference by correspondence following the Sixth Session of the Coordinating Committee.

Actions and activities proposed:
The group did not discuss specific actions and activities that need to be carried out, but agreed that the coordinator, Takashi Yoshida of JMA, would prepare an initial plan of action to facilitate the work of the working group.

47 Following the presentations, Dr. Kawamura commented that NEAR-GOOS in principle should follow the concept of an end-to-end system, and that in that respect, it was necessary to have a clear understanding of the potential users. The Chairperson further added that the working groups should consider the widest range of applications possible, including those outside the realm of expertise of the participating CC-members. In this regard, Dr. Kawamura referred to the need to consider environmental data as an example. Mr. Hasegawa cautioned the meeting about the extent that end-use products should be delivered by NEAR-GOOS activities supervised by the NEAR-GOOS Coordinating Committee given that the provision of end-use products would have legal and cost implications that are beyond the original mandate of the NEAR-GOOS Co-ordinating Committee. His preference goes to a NEAR-GOOS system that would yield generic products at the

intermediate level that can be adapted, modified and packaged for specific uses by relevant agencies and institutions (incl. for commercial purposes) as appropriate.

48 The meeting agreed that the results of the two drafting groups provided an adequate basis for the subsequent establishment of the working groups, and requested the Technical Secretary to formulate a more detailed Terms of References for each Working Group, and the respective coordinators to elaborate a specific plans of action to get the discussions started.

49 The Technical Secretary reminded the meeting that the two proposed working groups do not replace the responsibility of the CC-members to collaborate in the formulation of a strategic plan for subsequent adoption by the Seventh Meeting of the Coordinating Committee and Fifth Session of the WESTPAC Sub-Commission respectively. The members should develop this plan in parallel with the Technical Secretary and the Chairperson taking the lead.

50 Noting that the meeting had not been able to follow the agenda completely, the Chairperson summarised the discussion under Agenda Item 4 by reviewing the different conclusions, those being:

a. the establishment of two working groups charged with the elaboration of detailed and comprehensive project documents that highlight concrete steps toward establishing (i) an observation and data management capacity, and (ii) a data assimilation, modelling and forecasting capacity;
b. to set in motion a parallel process to draw up a strategic plan that will build on the discussion paper discussed at the previous CC-meeting;
c. and partly as a result of the preceding workshop, a consensus to enlist the support of interested scientists to elaborate specific fundable proposals for pertinent elements of a NEAR-GOOS initial observing system.

5. ADOPTION OF THE REPORT

51 The Committee was requested to endorse the Draft Summary Report with recommendations therein by correspondence, and authorized the NEAR-GOOS Chair and Technical Secretary - upon due endorsement by all CC-members - to submit the Summary Report and Recommendations therein to the Thirty-fourth Session of the IOC Executive Council planned for June 2002.

6. NEXT SESSION

52 The Committee decided that the Seventh Session of the NEAR-GOOS Coordinating Committee is best held in August 2002 two weeks prior to the Fifth Session of the IOC/WESTPAC Sub-Commission. It was further suggested to hold the meeting in Vladivostok upon approval and invitation of the relevant authorities in the Russian Federation.

7. CLOSURE

53 The Chairperson thanked everyone for their hard work and active participation in the meeting and preceding workshop.

54 The delegate of China expressed, on behalf of all delegations, his thanks to the Chairperson of the Committee and also thanked the secretariat staff for their efforts during the meeting.

55 The Chairperson closed the Session at 18:00 on Friday 31 August 2001.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF AGENDA
2.2 DESIGNATION OF RAPPORTEUR
2.3 WORKING ARRANGEMENTS

3. STATUS OF NEAR-GOOS: REPORT ON THE OPERATION

3.1 REPORT BY THE CHAIRMAN
3.2 REPORT BY THE TECHNICAL SECRETARY
3.3 REPORT ON REGIONAL DATA BASE MANAGEMENT

3.3.1 Regional Real Time Data Base
3.3.2 Regional Delayed Mode Data Base

3.4 REPORT ON DATA MANAGEMENT TRAINING COURSE
3.5 REPORT ON NATIONAL ACTIVITIES

3.5.1 China
3.5.2 Japan
3.5.3 Republic of Korea
3.5.4 Russian Federation

4. MEDIUM TERM NEAR-GOOS STRATEGY PLAN

4.1 SCOPE AND NATURE OF STRATEGY PLAN
4.2 DATA GATHERING: FILLING IN THE GAPS
4.3 DATA PROCESSING, QUALITY CONTROL AND DISSEMINATION
4.4 DATA PRODUCTS, VALUE ADDING SYSTEMS AND SERVICES
4.5 INFRASTRUCTURE AND MANAGEMENT
4.6 CAPACITY BUILDING
4.7 PROMOTION OF NEAR-GOOS
4.8 OTHER ISSUES

5. ADOPTION OF THE REPORT

6. NEXT SESSION

7. CLOSURE

ANNEX II

LIST OF PARTICIPANTS

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ANNEX III

ACTION LIST

No	Subject	Ref	Action proposed	Responsible	Target date	Comments
1	GODAR	11	- CC-members to consider participation in a GODAR project for the WESTPAC region.	All members	When feasible	
2	China National Databases	12	- Prof. Yu to continue raising the issue of data exchange and collaboration with agencies from other line ministries with relevant authorities	Prof. Yu	ASAP	
3	Availability of Palace Floats and ONR research data	13	- Technical Secretary to contact Dr. Steve Ryser and Dr. Lynne Taylor on the possible release of pertinent datasets of ONR-funded research in the NEAR-GOOS region.	Technical Secretary	ASAP	
4	GOOS Modules Strategic Design Plans	15	- Distribution of GOOS design plans as soon as they are published.	Technical Secretary	When feasible	
5	Data dissemination and exchange	18	- CC-members to request relevant agencies to reduce data processing times with a view to making the data more readily available in near real-time.	All members	ASAP	
7	GODAE	34	- CC-members to consider linking NEAR-GOOS to GODAE	All members	ASAP	
8	Medium-term strategy plan – enabling research	43	- Chairperson to discuss with relevant scientists on the elaboration of fundable proposals for specific elements of a functional NEAR-GOOS initial observing system, and relate these efforts to the proposed working groups and the overall strategic planning exercise.	Dr. Lee	ASAP	

No	Subject	Ref	Action proposed	Responsible	Target date	Comments
9	Working Groups	48	- Technical Secretary to formulate Terms of Reference for subsequent approval by Coordinating Committee members by Email correspondence. - Takashi Yoshida to prepare initial plan of action for the Ad Hoc Working Group on “Data Assimilation, Modelling and Forecasting” - Dong-young Lee to prepare an initial plan of action for the Ad Hoc Working Group on “Observations and Data Management” - Members of the working groups to work with the respective chairpersons toward the implementation and coordination of activities as agreed by the working groups.	Technical Secretary Dr. Yoshida Dr. Lee Members of respective working groups	ASAP ASAP ASAP Continuous	
10	Medium-term strategy plan	49	- CC-members to contribute in the formulation of the Strategic Plan. - Technical Secretary and Chairperson to coordinate the strategic planning exercise, prepare an initial outline for discussion and feedback, and oversee the subsequent completion of the strategic plan with inputs from all members and other relevant parties.	All members Technical Secretary	ASAP ASAP	
11	Next Session	52	- The Technical Secretary will consult with Russian CC-members on possible hosting of next session in Vladivostok	Technical Secretary	ASAP	

ANNEX IV

REPORTS ON REGIONAL AND NATIONAL DATABASES

IV.1 REPORT ON REGIONAL REAL TIME DATABASE

by Naoyuki Hasegawa, Japan Meteorological Agency

General state of operation - The Regional Real Time Data Base (RRTDB) has been operated successfully with only a few cases of planned short time suspensions of the operation for maintenance.

User registration - The number of the registered users of the RRTDB is 137 as of 1 August 2001 (Figure 1). This is 46 more than the number at the time of the last meeting of the NEAR-GOOS Coordinating Committee in December 2000. The users are from Japan (64), China (16), Republic of Korea (14), Russian Federation (12), USA (10), Thailand (5), Germany (2), UK (2) and others.

Provision of the data to RRTDB - In addition to the data available from the Global Telecommunication System (GTS) of the WMO World Weather Watch programme, data are contributed to RRTDB by the Japan Meteorological Agency (Japan) and its Marine Observatories, the Far East Regional Hydro-meteorological Research Institute (Russia), the Korea Ocean Research and Development Institute (Republic of Korea), the Japan Fisheries Information Center (Japan), the Ocean Research Institute of the University of Tokyo (Japan), and the Marine Environment Data Service (Canada).

Data retrieval from RRTDB - The frequency of the access to the RRTDB web page has been increasing since 1997 (Figure 2), and was around 2,000 hits/month late last year. There was a further increase this year, and the frequency is now over 5,000 hits/month.

The ftp data retrieval requests increased after the major change of the RRTDB structure in March 2000 including the provision of global observation data, and now 6,000 to 8,000 files are retrieved every month (Figure 3). In particular, the number of requests for the TESAC code data has increased substantially, probably because the Argo float data are exchanged in this format.

The data and products now available at the RRTDB are listed in Table 1 below.

Changes to the operation

New normals for SST anomaly data/charts - The sea surface temperature normals used in the JMA SST analysis were changed from 1961-1990 base period to 1971-2000 base period. The old normals are still available at the RRTDB.

Planned hardware update - The hardware of the RRTDB server will be replaced in the autumn this year or later mainly to cope with the further expansion of the data volume. However, the new system will have the same url and ftp addresses and will retain the user account information, so users will not have to take any action because of this replacement.

Proposed minor system modification - The RRTDB server has a directory prepared for each of the users where they can put the data. This was to encourage the data provision and to assist the users who wish to provide the data but who do not have their own data server. However with a few exceptions, these directories are not actually used. It is, therefore, proposed that the unused user directories be removed at the time of the hardware replacement mentioned above. However such a directory can be retained or newly prepared if a user requests.

Fig.1 Total of NEAR-GOOS RRTDB Registered Users (Mar 1997 - Jul 2001)

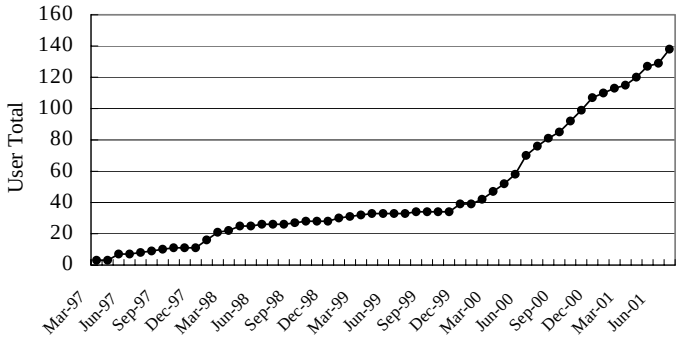


FIG.2 NEAR-GOOS RRTDB WWW ACCESS (Mar 1997 - Jul 2001)

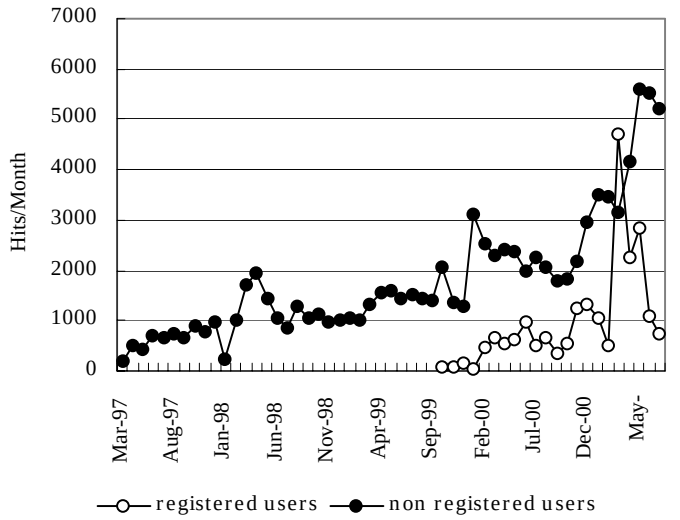


Fig.3 NEAR-GOOS RRTDB FTP ACCESS (Mar 1997 - Jul 2001)

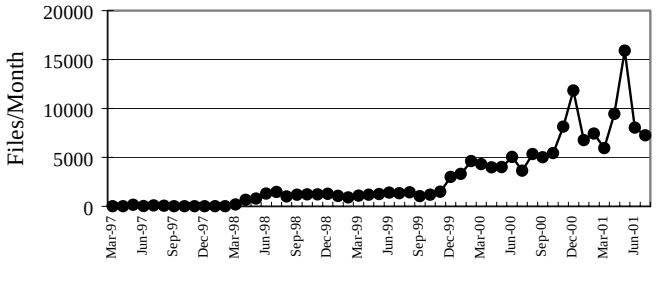


Table 1: List of Data/Products available at RRTDB

Oceanographic and marine meteorological observations on GTS
Ship observations from Far Eastern Regional Hydrometeorological Research Institute
Buoy observations provided by Korea Ocean Research and Development Institute
Sea water temperature observations provided by Japan Fisheries Information Service Center
Subsurface temperature profiles provided by Ocean Research Institute/University of Tokyo
Data converted into the common formats
Temperature and winds
GTSPP quality controlled temperature and salinity data
JMA Products
Daily sea surface temperatures analysis (charts and grid point value)
Western North Pacific sea surface temperatures (charts and grid point value)
Global sea surface temperatures (charts and grid point value)
Subsurface temperatures in seas around Japan (charts and grid point value)
Pacific subsurface temperatures (charts and grid point value)
Observations by JMA Research Vessels (charts only)

IV.2 REPORT ON REGIONAL DELAYED MODE DATABASE (RDMDB)

by RDMDB Manager, Japan Oceanographic Data Center

The Japan Oceanographic Data Center (JODC) has been operating RDMDB since October 1996 following the recommendation of the first session of the NEAR-GOOS Coordinating Committee held in Bangkok in September 1996.

The status of the RDMDB data management by JODC as of the end of June 2001 is as follows. The total volume of data is about 3GB, of which about 58% comprises of tidal data and the remaining 42% mostly consisting of water temperature data and wind data. 24 different types of data files are handled by RDMDB (Table 2).

Table 2: Data type and volume of NEAR-GOOS RDMDB

Types of Data	**Description of Data**	**Data Volume**
BATHY	Regional Data Sets of BATHY Report	8.6 MB
BATHY_G	Global Data Sets of Bathy Report	5.6 MB
BUOY	Regional Data Sets of BUOY Report	397.5 MB
BUOY_G	Global Data Sets of BUOY Report	66.7 MB
SHIP	Regional Data Sets of SHIP Report	99.9 MB
SHIP_G	Global Data Sets of Bathy Report	273.5 MB
TESAC	Regional Data Sets of TESAC Report	1.0 MB
TESAC_G	Global Data Sets of TESAC Report	16.0 MB
TRACKOB	Regional Data Sets of TRACKOB Report	0.4 MB
TRACKOB_G	Global Data Sets of TRACKOB Report	0.9 MB
SSTANL(JMA)	Gridded Daily Sea Surface Temperature data in the Western North Pacific	124.8 MB
GLBSST(JMA)	Monthly Mean Sea Surface Temperature	0.6 MB
WNPSST(JMA)	10 days Mean Sea Surface Temperature	0.6 MB

Types of Data	**Description of Data**	**Data Volume**
ADJSUBS(JMA)	Monthly Mean Subsurface Temperature in seas around JAPAN (100m, 200m, 400m)	0.3 MB
SUBST	Sub Surface Temperature decoded at RRTDB	183.1 MB
SUBST_ERROR	Sub Surface Temperature decoded Error Report	2.5 MB
PACSUBS(JMA)	Monthly Mean Subsurface Temperature in Pacific (100m, 200m, 400m)	2.0 MB
WIND	Wind decoded Data at RRTDB	49.2 MB
WIND_ERROR	Wind decoded Error Report	0.4 MB
FERHRI	Marine Meteorological observation data on board by FERHRI, Russia	2.6 MB
JAFIC	Sea Surface/Sub surface Temperature from JAFIC, Japan	17.8 MB
PALACE	Sub surface temperature profile observed by PALACE float operated by ORI, University of Tokyo, Japan	0.1 MB
TOHKU_Uv.	XBT data observed by Tohoku University	0.1 MB
30s*	30 sec interval tide data at the JHD tidal stations	1718.2 MB
Total of Data Volume		2972.4 MB

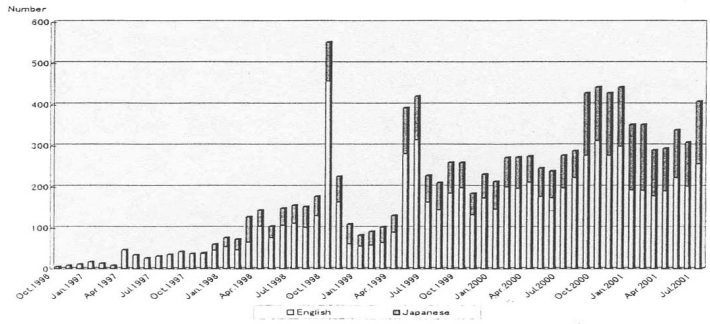
On 28 May 1999, the RDMDB homepage was renewed, simplifying the user registration in accordance with a change of the operation policy of NEAR-GOOS database (as decided at the third session of NEAR-GOOS Coordinating Committee). Since then, 74 organizations and persons have registered for RDMDB. This brings the total number of the registration to 139. The number of registrations of each country is shown in Table 3. "Others" in Table 3 consists of Thailand, Malaysia, Pakistan, USA, and United Kingdom.

Table 3: Number of Registrations.

Country	Institution				
	Government	Education	Nonprofit Organization	Others	Total
Japan	24	40	12	15	91
China	6	1	1	1	9
Rep. of Korea	2	2		3	7
Russian Federation	7			1	8
Others	4	7	1	12	24
Total	43	50	14	32	139

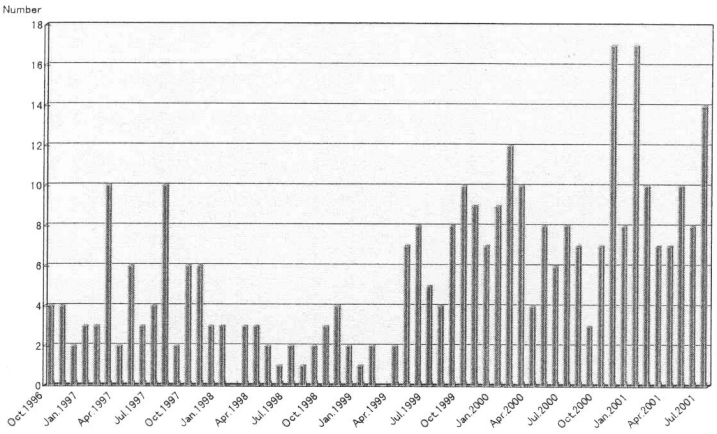
Access to the top page of the RDMDB website is increasing gradually. Before the simplification of user registration, the number of the monthly access was under 100, but recently it reaches about 400 (Fig. 4). The RDMDB homepages are accessed not only by registered users, but also by persons from all over the world.

Figure 4: Number of Access to RDMDB WWW Top Page



The number of users that download data files is also gradually increasing. Before May 1999, the average of the numbers of users that download data in a month was only about 3, which recently has increased to about 10 users every month. The monthly number is shown in Figure 5.

Figure 5: Monthly number of users that download data files



As the data file of RDMDB consists of data of one item in a month, when users download a data file, they get all data in a month. At the last session, we reported that the total number of the downloaded data files since RDMDB started reached 1977 as of November 2000. Since then, 1177 data files were downloaded for 8 months. The total number since RDMDB started reaches 3154. Monthly download numbers is shown in Table 4.

Table 4: The number of monthly downloaded data files per country

	Dec. 2000	Jan. 2001	Feb. 2001	Mar. 2001	Apr. 2001	May 2001	June 2001	July 2001
Japan	75	181	44	13	44	13	35	113
China	0	0	460	0	0	2	0	10
Korea	0	32	0	4	0	0	0	3
Russia	0	4	2	14	73	22	7	7
USA	0	16	1	0	0	0	0	0
Unknown	0	1	0	0	0	1	0	0
Total	75	234	507	31	117	38	42	133

IV.3 COUNTRY REPORTS

The country reports of Japan are incorporated in paragraphs IV.1 and IV.2 of the present Annex.

IV.3.1 China

By Prof. Zhouwen Yu and Dr. Wang Hong

NEAR-GOOS Real Time Database, real-time monitoring and forecasts

Since its establishment in 1998, the China NEAR-GOOS Real-time Database has been in operation although not much development was made during the last one year. The data type and data amount are almost the same as last year. The real-time data included in the database consist of 14 coastal station observations, one buoy data (the buoy in the Yellow Sea resumed operation in April 2002), some GTS oceanographic data and forecasting products. The data type is mainly physical, for example, waves, sea surface temperature, wind, sea surface pressure; no chemical or biological data are included. The data in the database are renewed everyday, and transferred to the China NEAR-GOOS Delayed Mode Database operated by National Marine Data and Information Service in Tianjin.

The users are mainly marine environment forecasters. Some other people who are engaged in marine management and production activities at sea also have access the database. Due to the insufficiency of the data in the database, the number of users is small.

Some programmes related to NEAR-GOOS development are being carried out in China. These include the following:

- Shanghai Pilot/Demonstration Monitoring System has been established, and is in operation now;
- A programme on the Improvement and Expansion of Coastal Observation Network is being conducted and will be finished at the end of the year;
- A 3-year project on Marine Disaster Forecasting Technique is initiated;
- Application for financial support for China Argo program is in progress.

China NEAR-GOOS Delayed Mode Data Base

Major Activities Since Fifth Session

Since the 5111 Session of IOC/WESTPAC Coordinating Committee for NEAR-GOOS, the NMDIS Working Group for NEAR-GOOS has made the following progress on maintenance of Delayed Mode Data Base:

- The sub-pages of China NEAR-GOOS Delayed Mode Data Base have been updated;
- On the pages for data provision, the column “Observation in bases FM 13-VII SHIP”, “the Coastal Station Data of Russia” and “meteorological Data of Korea” have been added
- In order to enhance the efficiency of the service. the data transmitting speed of CDMDB has been advanced to 512 KB/Sec.

Information Update

Since the Fifth Session of IOC/WESTPAC Coordinating Committee for NEAR-GOOS, the information of CDMDB has been updated and approximate 10MB data have been added. In

addition to the data transferred from CRTDB to CDMDB on a monthly basis, meteorological data, ship observation data, coastal station data released by the participating countries of NEAR-GOOS have also been added to China DMDB. This could provide convenience for Chinese users to access NEAR-GOOS data and may avoid traffic jam of the Internet. The data increase from Oct. 2000 to Jul. 2001 is shown in the table below.

Table 5: Increase in volume of data in the China Delayed Mode Database

Data Type	Increase in volume (KB)
Buoy data from China	30.8
Buoy data from Korea	532.5
Ship observation data from China	3340.3
Ship observation data from Russia	3161.1
Meteorological data from Korea	184.4
Station temperature and salinity data from China	137.3
Station wave and wind data from China	484.4
Coastal station data of China	843.8
Coastal station data of Russia	582.7
Total	9297.3

Utilization of CDMDB and Related Services

Up to July 2001, nearly 3800 users have visited CDMDB. Most of the visitors were from universities, colleges, and research institutions both domestic and abroad, including Xiamen University, Zhejiang University, South Sea Institute of Oceanology, First Institute of Oceanography, Dalian College of Technology, Qinghua University, South China University of Science and Technology, Qingdao University of Oceanography, Nanjing Meteorological Research Institute, Zhongshan University, Shanghai Observatory, Shangdong University of Agriculture, Yellow Sea Fisheries Research Institute, Tokyo University, KORDI, Birmingham University, FERHRI, JODC, IOC/WESTPAC, etc. the purpose of the visit can be classified as follows:

- Study and research;
- Data inquiry and access;
- For engineering and education;
- Marine and coastal management;
- Research and analysis, such as sea ice model, air-sea interactions, and El Nino.

Future Development

In order to provide better service, more types of data products are going to be released on the CDMDB website, such as tide and tidal currents prediction for major ports in the NEAR-GOOS region. The production of a series of CD-ROMs of marine atlases using GIS technology and covering the NEAR-GOOS region is also considered.

Problems

The real time data from some national RTDBs are not always available for every day. Occasionally it happens that data for one day, a few days or even for longer periods of times are missing. It is suggested that there should be a notification if this happens.

Access to some of the national RTDBs is sometimes temporarily disabled. More attention should be paid to the database maintenance.

Needs for GOOS data in China: A Summary of the National GOOS User Meeting, June 2000, Beijing.

Long-term Goals Expected by Users

From the viewpoint of users' requirements, it is hoped that GOOS, as well as NEAR-GOOS, will become an operational system for data gathering, distribution and exchange. It is believed that such a system will be of great significance for the sustainable development of the ocean and the protection of the ocean. It needs the common efforts of all the countries in the world to build such a system and it also needs a long time.

Present Needs for GOOS in China

Now in China, marine activities are concentrated in the coastal area and in the waters of Northwest Pacific. These activities include marine fishery, marine aquaculture, ocean shipping, offshore oil exploration, etc. For the safety of the marine activities and for the reduction of economic losses caused by marine disasters, China has been making operational routine forecasting of the marine environment. To this end, ocean observational data of the Northwest Pacific Ocean, such as VOS observations, buoy data as well as the near-shore environment data (including physical data, chemical data and biological data) are urgently needed.

In the coastal waters of China, there are extensive marine production activities and frequent marine disasters such as big waves, storm surge, red tides, and sea ice. Pollution caused by human activities, deterioration of the ecological environment and coastline variation constitute problems which urgently need to be solved. International cooperation is needed in the exchange of related data, technology, experience and scientific results.

China is improving all the monitoring systems, and will update all the equipment of the marine environment monitoring network. High-quality data will be available with the advanced network.

IV.3.2 Republic of Korea

Report on the Korea Delayed Mode Data Base
By Hee-dong Jeong

General Description

The National Fisheries Research and Development Institute (NFRDI) is a branch of the Ministry of Maritime Affairs Fisheries (MOMAF) and conducts observations and research on the integrated water quality environment through oceanographic observations, marine pollution observations, fresh water pollution observations, and marine remote sensing in order to assure efficient use and the conservation of fisheries resources. Now NFRDI is responsible for the function of the Korea Oceanographic Data Center (KODC) and the missions of the Designated National Oceanographic Data Management Agency (DNODMA) of MOMAF.

Roles and Responsibilities

KODC has been fulfilling the role of oceanographic data bank of Korea in collecting important and useful data and providing users with those data. In Korea, oceanographic observations including environmental monitoring have been carried out by several organizations such as the NFRDI, the Oceanographic Research Institute (NORI), the Korea Ocean Research and Development Institute (KORDI), the National Maritime Police Administration (NMPA) and the Korea Institute of Geology, Mining and Materials (KIGAM).

KODC has been carrying out its services internationally as the National Oceanographic Information Exchange promoted by IOC and IGOSS. In addition to the above role, KODC is in charge of the NEAR-GOOS National Delayed Mode Data Base management and services.

National Activities in support of NEAR-GOOS

MOMAF reestablished the Korea Oceanographic Commission(KOC) which consists of 20 experts of related organizations and universities to support IOC, WESTPAC and NEAR-GOOS activities in Korea. MOMAF also established the Korean Argo Subcommission under the KOC to take part in the Argo Project systematically and already hosted IOC/WESTPAC Symposium and NEAR-GOOS Marine Environment Forecasting Workshop in Seou127-30 Aug. 2001.

Korea DMDB for NEAR-GOOS

Considering the multidisciplinary nature of ocean development and its long term prospect, KODC has a four year project (1999-2002) to develop an integrated oceanographic data and information network at the national level in order to increase the common use and easier access to the information (Table 6).

Table 6: Types of information contained in KODC

Division	Items
Oceanographic Information	Research & cruise summary. Research organizations, Oceanographic domestic oceanographer, research vessels, international organizations and programmes related in ocean, foreign marine policy, oceanographic equipments, NOPs, CSR
Oceanographic Metadata	1. Physical Oceanography: temperature, salinity, current, tides, change of sea level, optic properties, acoustics
	2. Chemical Oceanography: pH, DO, BOD, COD, nutrients, SPM, heavy metals, radioactivity substances, organic compound, petroleum and related chemicals, PAHs, toxic materials
	3. Biological Oceanography: primary productivity , chlorophyll, marine microbes, plankton, benthos, attached organism, egg and larvae, nekton, algae, marine reptilia, marine mammalia
	4. Geological Oceanography & Geophysics: depth and bottom topography, geomagnetism, paleomagnetism, gravity, earthquake, seismic profiling, image of sea bottom, lithostratigraphy, data from surface and core sediments, suspended sediment, information of coastal line
	5. Marine Meteorology air temperature, atmospheric pressure, wind speed, wind direction, precipitation, amount of sunlight and cloud, humidity, composition of air

The homepage (http://kosi.nfrdi.re.kr) of this network has already provided oceanographic information including cruise summary reports, and a directory of research organizations, oceanographers, research vessels and so on from 2000. This network will accelerate the mutual exchange of oceanographic information and data among the oceanographic research organizations, and will serve as a guide to the user of oceanography. Within this system, the Korea DMDB for NEAR-GOOS has been constructed successfully and is now being serviced. (http://kosi.nfrdi.re.kr/HTML/near_goos/html/index.htm)

Available data and information are as follows;

- Serial Oceanographic Data (1961-2000)
- Water temperature, Salinity
- Nutrients
- Zooplankton biomass
- Coastal Oceanographic Data (1923-2000)
- Water temperature, Air temperature at 10:00am daily
- Daily coastal water temperature graph
- Mean coastal water temperature data

KODC Services and Publications

Services

- Daily SST chart
- Vertical profiles of temperature in Korean Waters (bi-monthly)
- Weekly and Monthly marine information
- HABs News (for the information of HABs, daily in summer)
- Near-shore cold water warning service during summer seasons

Publications

- KODC Newsletter (semi-annual) since 1983
- Annual Report of oceanographic observations since 1952
- SST Charts on Korean Waters since 1991
- Oceanographic Tables (mean values for temperature, salinity and dissolved oxygen) in Korean Waters (published in 1979)

IV.3.3 Russian Federation

By Dr. Vyacheslav Lobanov and Dr. Evgeny Karasev

Report on the NEAR-GOOS Activities in the Russian Federation in 2000-2001

The NEAR-GOOS project has been recognized in Russia as one of the most important regional components of GOOS programme. It is pointed out however that the development of the NEAR-GOOS project should be based on the experience of previous data exchange related programs such as IODE/GODAR, IGOSS and national program “Integrated Information System on the World Ocean”.

The main oceanographic organizations in the Russian Far East that provide oceanographic observations and data collection and management in the NEAR-GOOS area are:

- Far Eastern Regional Hydrometeorological Research Institute (FERHRI);

- V.I. Il'ichev Pacific Oceanological Institute (POI);
- Pacific Fisheries and Oceanographic Research Centre (TINRO-Centre);
- Primorye Regional Administration on Hydrometeorology and Environmental Monitoring (PRIMGIDROMET)

Currently, the main activities under the NEAR-GOOS project include:

- Maintenance of Real-Time Data Base (FERHRI);
- Maintenance of Delayed Mode Data Base (POI);
- Implementation of hydrographic observation in the Japan/East Sea (POI, FERHRI, TINRO);
- Routine hydro-meteorological observations implementation, data collection and distribution (PRIMGIDROMET);
- Provision of information on the NEAR-GOOS project through internet home pages (FERHRI, POI).

The major part of hydrographic data that include CTD and chemical observations are provided by research vessels of POI, FERHRI and TINRO. In addition to this two PALACE drifters were deployed by FERHRI in the Japan/East Sea as part of the Argo programme.

The Real Time Data Base (RTDB) for NEAR-GOOS was created in 1998 by FERHRI to serve as the National RTDB for NEAR-GOOS. This database includes the results of regular observations from ships and 3 coastal meteorological stations of neighbouring marine areas. The measured parameters include water and air temperature, salinity, sea level, waves, ice characteristics, meteorological parameters. The information on RTDB for NEAR-GOOS is located on the web site:
http://www.hydromet.com.ru/project/near-goos/

The Delayed Mode Data Base (DMDB) for NEAR-GOOS was created in 1998 by the V.I.Il'ichev Pacific Oceanological Institute, Far Eastern Branch of Russian Academy of Sciences (POI) to serve as the National DMDB for NEAR-GOOS. The database includes the results of historical database of Russian and foreign observations on temperature, salinity, chemical and biological parameters in the Northwestern Pacific including the NEAR-GOOS area. It also includes schemes of oceanographic cruises by POI and TINRO vessels. Over the past year new data of 4 more POI expeditions with around 150 stations and information on 13 TINRO cruises implemented in 2000 were added to the data base. The information on the DMDB is located at the following URL: http://www.pacific.marine.su/cdsdb/ngpdb.htm

ANNEX V

TERMS OF REFERENCES OF AD HOC WORKING GROUPS

Note: These Terms of References were elaborated by the Technical Secretary after the meeting for subsequent approval by the Coordinating Committee through correspondence. Their appearance in this report implies their respective endorsement by the Coordinating Committee.

Ad Hoc Working Group I: Ad Hoc Working Group on "Observations and Data Management".

Coordinator: Dr. Dong-young Lee

Terms of Reference

a. Nature:

An Ad Hoc Working Group is hereby established as an advisory body to the NEAR-GOOS Coordinating Committee for the elaboration of a document that outlines a strategy to develop and maintain a regional ocean observing system for the North East Asian region.

b. Composition:

The Working Group of up to 10 members shall consist of several CC-members supplemented with experts drawn from the relevant areas of expertise. An attempt shall be made to seek representation from all participating countries. One of the members shall be elected as chairperson of the group, who will act as coordinator. The responsibility for coordinator may rotate among the group members.

c. Responsibility:

The Ad Hoc Working Group shall:

i. Prepare an outline for an initial observing system for the Northeast Asian region with a focus on both the collection of data and subsequent data management.
ii. Solicit the support of advisory groups of selected key experts in developing and elaborating concrete proposals for strategic components of the initial observing system.
iii. Consult with relevant experts as members of advisory groups on the feasibility and usefulness of the proposed projects, and adjust the plans where necessary.
iv. Seek support for the proposed activities among relevant research groups and agencies in the member countries.
v. Ensure the continued relevance of the proposed activities within the framework of the NEAR-GOOS Strategic Plan that is to be developed concurrently.
vi. Ensure that the observing system meets the requirements of potential users and contributes to a regional operational forecasting capability.
vii. Identify possible contributing agencies and institutes and work arrangements by which the proposed project activities can be realized.
viii. Report the findings in the form of a project document to the Seventh Session of the NEAR-GOOS Coordinating Committee.

The working group shall work by E-mail correspondence as much as possible.

Ad Hoc Working Group II: "Data Assimilation, Modelling and Forecasting"

Coordinator: Dr. Takashi Yoshida

Terms of Reference

a. Nature:

An Ad Hoc Working Group is hereby established as an advisory body to the NEAR-GOOS Coordinating Committee for the elaboration of a document that outlines a strategy to develop an operational oceanography capacity in the NEAR-GOOS region.

b. Composition:

The Working Group of up to 10 members shall consist of several CC-members supplemented with experts drawn from the relevant areas of expertise. An attempt shall be made to seek representation from all participating countries. One of the members shall be elected as chairperson of the group, who will act as coordinator. The responsibility for coordinator may rotate among the group members.

c. Responsibility:

The Ad Hoc Working Group shall:

i. Prepare an outline for a feasible demonstration project in operational oceanography involving a basin-scale circulation model.
ii. Consult with relevant experts on the feasibility and usefulness of the proposed project, and adjust the plan where necessary.
iii. Seek support for the proposed activity among relevant research groups and agencies in the member countries.
iv. Ensure the continued relevance of the proposed activity within the framework of the NEAR-GOOS Strategic Plan that is to be developed concurrently.
v. Specify the data requirements and communicate these to the Working Group on Observations and Data Management.
vi. Identify possible contributing agencies and institutes and work arrangements by which the proposed project activities can be realized.
vii. Report the findings in the form of a project document to the Seventh Session of the NEAR-GOOS Coordinating Committee.

The working group shall work by Email correspondence as much as possible.

ANNEX VI

LIST OF ACRONYMS

GLOSS	Global Sea Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GODAR	Global Oceanographic Data Archaeology and Rescue
GOOS	Global Ocean Observing System
GTS	Global Telecommunication System
I-GOOS	IOC-WMO-UNEP Committee for the Global Ocean Observing System
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange Programme
J-COMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JGOFS	Joint Global Ocean Flux Study
JMA	Japan Meteorological Agency
JODC	Japan Oceanographic Data Centre
MOMAF	Ministry of Maritime Affairs and Fisheries (Republic of Korea)
NEAR-GOOS	North-East Asian Regional GOOS
ODC	Ocean Dynamics and Climate programme of IOC/WESTPAC
ONR	Office of Naval Research (USA)
PICES	North Pacific Marine Science Organization
RDMDB	Regional Delayed Mode Data Base
RRTDB	Regional Real Time Data Base
SEAGOOS	South-East Asian GOOS
SNU	Seoul National University
SST	Sea Surface Temperature
TESAC	Temperature, salinity and current report from a sea station
WMO	World Meteorological Organization of the United Nations
WESTPAC	IOC Sub-Commission for the Western Pacific

In this Series, entitled

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued:

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans S. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' ***(Also printed in Spanish)***
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
11. First Session of the IOC Consultative Group on Ocean Mapping ***(Also printed in French and Spanish)***
12. Joint 100-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and lntercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica lnternacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica ***(Spanish only)***
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources ***(Also printed in French and Spanish)***
25. Third Session of the IOC Group of Experts on Effects of Pollutants
26. Eighth Session of the IOC-UNEP Group of Experts on Methods, Standards and lntercalibration
27. Eleventh Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans ***(Also printed in French)***
28. Second Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
29. First Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities ***(Also printed in Spanish)***
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System
34. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
35. Fourth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
36. First Consultative Meeting on RNODCs and Climate Data Services
37. Second Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow
38. Fourth Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
39. Fourth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
40. Fourteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
41. Third Session of the IOC Consultative Group on Ocean Mapping
42. Sixth Session of the Joint IOC-WMO-CCPS Working Group on the Investigations of 'El Niño' (***Also printed in Spanish)***
43. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
44. Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
45. Ninth Session of the IOC-UNEP Group of Experts on Methods, Standards and lntercalibration
46. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
47. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
48. Twelfth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
49. Fifteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
50. Third Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
51. First Session of the IOC Group of Experts on the Global Sea-Level Observing System
52. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean
53. First Session of the IOC Editorial Board for the International Chart of the Central Eastern Atlantic ***(Also printed in French)***
54. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico ***(Also printed in Spanish)***
55. Fifth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
56. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
57. First Meeting of the IOC *ad hoc* Group of Experts on Ocean Mapping in the WESTPAC Area
58. Fourth Session of the IOC Consultative Group on Ocean Mapping

59. Second Session of the IOC-WMO/IGOSS Group of Experts on Operations and Technical Applications
60. Second Session of the IOC Group of Experts on the Global Sea-Level Observing System
61. UNEP-IOC-WMO Meeting of Experts on Long-Term Global Monitoring System of Coastal and Near-Shore Phenomena Related to Climate Change
62. Third Session of the IOC-FAO Group of Experts on the Programme of Ocean Science in Relation to Living Resources
63. Second Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
64. Joint Meeting of the Group of Experts on Pollutants and the Group of Experts on Methods, Standards and Intercalibration
65. First Meeting of the Working Group on Oceanographic Co-operation in the ROPME Sea Area
66. Fifth Session of the Editorial Board for the International Bathymetric and its Geological/Geophysical Series
67. Thirteenth Session of the IOC-IHO Joint Guiding Committee for the General Bathymetric Chart of the Oceans ***(Also printed in French)***
68. International Meeting of Scientific and Technical Experts on Climate Change and Oceans
69. UNEP-IOC-WMO-IUCN Meeting of Experts on a Long-Term Global Monitoring System
70. Fourth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
71. ROPME-IOC Meeting of the Steering Committee on Oceanographic Co-operation in the ROPME Sea Area
72. Seventh Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' ***(Spanish only)***
73. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico ***(Also printed in Spanish)***
74. UNEP-IOC-ASPEI Global Task Team on the Implications of Climate Change on Coral Reefs
75. Third Session of the IODE Group of Experts on Marine Information Management
76. Fifth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
77. ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area
78. Third Session of the IOC Group of Experts on the Global Sea-level Observing System
79. Third Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
80. Fourteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
81. Fifth Joint IOG-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
82. Second Meeting of the UNEP-IOC-ASPEI Global Task Team on the Implications of climate Change on Coral Reefs
83. Seventh Session of the JSC Ocean Observing System Development Panel
84. Fourth Session of the IODE Group of Experts on Marine Information Management
85. Sixth Session of the IOC Editorial Board for the International Bathymetric chart of the Mediterranean and its Geological/Geophysical Series
86. Fourth Session of the Joint IOC-JGOFS Panel on Carbon Dioxide
87. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Pacific
88. Eighth Session of the JSC Ocean Observing System Development Panel
89. Ninth Session of the JSC Ocean Observing System Development Panel
90. Sixth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
91. First Session of the IOC-FAO Group of Experts on OSLR for the IOCINCWIO Region
92. Fifth Session of the Joint IOC-JGOFS CO, Advisory Panel Meeting
93. Tenth Session of the JSC Ocean Observing System Development Panel
94. First Session of the Joint CMM-IGOSS-IODE Sub-group on Ocean Satellites and Remote Sensing
95. Third Session of the IOC Editorial Board for the International Chart of the Western Indian Ocean
96. Fourth Session of the IOC Group of Experts on the Global Sea Level Observing System
97. Joint Meeting of GEMSI and GEEP Core Groups
98. First Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
99. Second International Meeting of Scientific and Technical Experts on Climate Change and the Oceans
100. First Meeting of the Officers of the Editorial Board for the International Bathymetric Chart of the Western Pacific
101. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
102. Second Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
103. Fifteenth Session of the Joint IOC-IHO Committee for the General Bathymetric Chart of the Oceans
104. Fifth Session of the IOC Consultative Group on Ocean Mapping
105. Fifth Session of the IODE Group of Experts on Marine Information Management
106. IOC-NOAA *Ad hoc* Consultation on Marine Biodiversity
107. Sixth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
108. Third Session of the Health of the Oceans (HOTO) Panel of the Joint Scientific and Technical Committee for GLOSS
109. Second Session of the Strategy Subcommittee (SSC) of the IOC-WMO-UNEP Intergovernmental Committee for the Global Ocean Observing System
110. Third Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
111. First Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate
112. Sixth Session of the Joint IOC-JGOFS C02 Advisory Panel Meeting
113. First Meeting of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS)
114. Eighth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño" ***(Spanish only)***
115. Second Session of the IOC Editorial Board of the International Bathymetric Chart of the Central Eastern Atlantic ***(Also printed in French)***
116. Tenth Session of the Officers Committee for the Joint IOC-IHO General Bathymetric Chart of the Oceans (GEBCO), USA, 1996
117. IOC Group of Experts on the Global Sea Level Observing System (GLOSS), Fifth Session, USA, 1997
118. Joint Scientific Technical Committee for Global Ocean Observing System (J-GOOS), Fourth Session, USA, 1997
199 First Session of the Joint 100-WMO IGOSS Ship-of-Opportunity Programme Implementation Panel, South Africa, 1997
120. Report of Ocean Climate Time-Series Workshop, Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate, USA, 1997

121. IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS), Second Session, Thailand, 1997

122. First Session of the IOC-IUCN-NOAA *Ad hoc* Consultative Meeting on Large Marine Ecosystems (LME), France, 1997

123. Second Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), South Africa, 1997

124. Sixth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico, Colombia, 1996 ***(also printed in Spanish)***

125. Seventh Session of the IODE Group of Experts on Technical Aspects of Data Exchange, Ireland, 1997

126. IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), First Session, France, 1997

127. Second Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 1998

128. Sixth Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1997

129. Sixth Session of the Tropical Atmosphere - Ocean Array (TAO) Implementation Panel, United Kingdom, 1997

130. First Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 1998

131. Fourth Session of the Health of the Oceans (HOTO) Panel of the Global Ocean Observing System (GOOS), Singapore, 1997

132. Sixteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), United Kingdom, 1997

133. First Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1998

134. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IOC/EB-IBCWIO-IW3), South Africa, 1997

135. Third Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), France, 1998

136. Seventh Session of the Joint IOC-JGOFS C02 Advisory Panel Meeting, Germany, 1997

137. Implementation of Global Ocean Observations for GOOS/GCOS, First Session, Australia, 1998

138. Implementation of Global Ocean Observations for GOOS/GCOS, Second Session, France, 1998

139. Second Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Brazil, 1998

140. Third Session of IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), China, 1998

141. Ninth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Ecuador, 1998 ***(Spanish only)***

142. Seventh Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Croatia, 1998

143. Seventh Session of the Tropical Atmosphere-Ocean Array (TAO) Implementation Panel, Abidjan, Côte d'Ivoire, 1998

144. Sixth Session of the IODE Group of Experts on Marine Information Management (GEMIM), USA, 1999

145. Second Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), China, 1999

146. Third Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Ghana, 1999

147. Fourth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC); Fourth Session of the WCRP CLIVAR Upper Ocean Panel (UOP); Special Joint Session of OOPC and UOP, USA, 1999

148. Second Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1999

149. Eighth Session of the Joint IOC-JGOFS CO2 Advisory Panel Meeting, Japan, 1999

150. Fourth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Japan, 1999

151. Seventh Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1999

152. Sixth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 1999

153. Seventeenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), Canada, 1999

154. Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y el Golfo de Mexico (IBCCA), Septima Reunión, Mexico, 1998

IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA), Seventh Session, Mexico, 1998

155. Initial Global Ocean Observing System (GOOS) Commitments Meeting, IOC-WMO-UNEP-ICSU/Impl-III/3, France, 1999

156. First Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Venezuela, 1999 ***(also printed in Spanish and French)***

157. Fourth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), China, 1999

158. Eighth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Russian Federation, 1999

159. Third Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), Chile, 1999

160. Fourth Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS). Hawaii, 2000

161. Eighth Session of the IODE Group of Experts on Technical Aspects of Data Exchange, USA, 2000

162. Third Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 2000

163. Fifth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Poland, 2000

164. Third Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 2000

165. Second Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Cuba, 2000 ***(also printed in Spanish and French)***

166. First Session of the Coastal Ocean Observations Panel, Costa Rica, 2000

167. First GOOS Users' Forum, 2000

168. Seventh Session of the Group of Experts on the Global Sea Level Observing System, Honolulu, 2001

169. First Session of the Advisory Body of Experts on the Law of the Sea (ABE-LOS), France, 2001 ***(also printed in French)***

170. Fourth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, Chile, 2001

171. First Session of the IOC-SCOR Ocean CO_2 Advisory Panel, France, 2000

172. *Cancelled*

173. Third Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, USA, 2001 ***(also printed in Spanish and French)***

174. Second Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Italy, 2001

175. Second Session of the Black Sea GOOS Workshop, Georgia, 2001

176. Fifth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2000

177. Second Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Morocco, 2002 ***(also printed in French)***

178. Third Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Vietnam, 2002

179. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002

180. Second Session of the IOC-SCOR Ocean CO_2 Advisory Panel, Honolulu, Hawaii, U.S.A, 2002 ***(electronic copy only)***

181. IOC Workshop on the Establishment of SEAGOOS in the Wider Southeast Asian Region, Seoul, Republic of Korea, 2001 (SEAGOOS preparatory workshop) ***(electronic copy only)***

182. Third Session of the GOOS Users' Forum and Coastal Ocean Observations Panel, Vietnam, 2002

183. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002

184. Seventh Session of the IODE Group of Experts on Marine Information Management (GEMIM), France, 2002 ***(electronic copy only)***

185. Sixth Session of IOC/WESTPAC Coordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2001 ***(electronic copy only)***