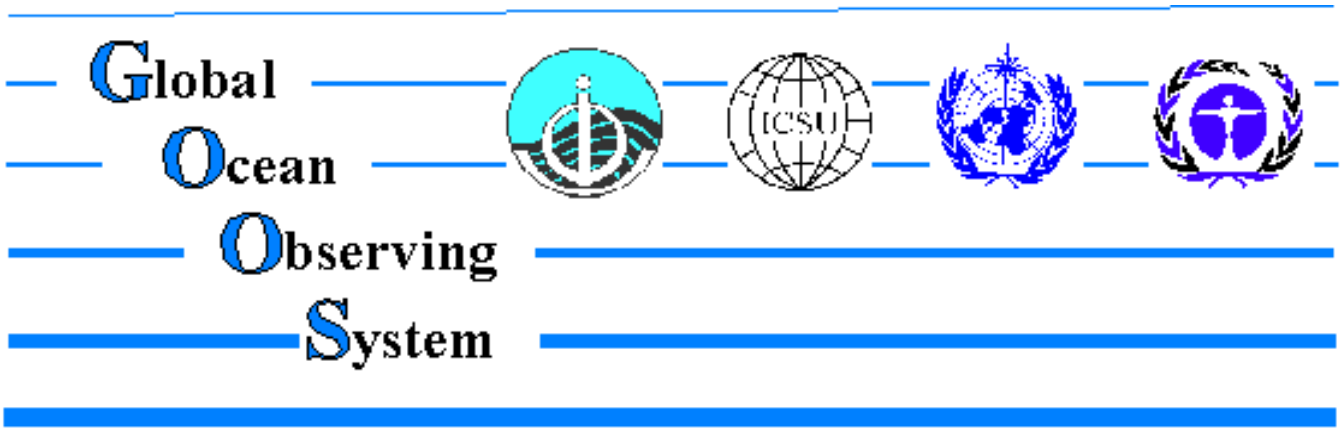

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

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

Fifth Session
Seoul, Republic of Korea
7 – 8 December 2000

GOOS Report No. 100

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IOC/WESTPAC-NEAR-GOOS-CC-V/3
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ABSTRACT

The Fifth Session of the NEAR-GOOS Coordinating Committee was held in Seoul, Republic of Korea, 7-8 December 2000. The main objective of the meeting was to agree on a workable mechanism for the elaboration of a medium-term strategy plan for NEAR-GOOS. The initiation of such a process coincides with the completion of the design plans for LMR, HOTO and C-GOOS, thus allowing for the incorporation of pertinent elements thereof in this regional pilot programme. In order to ensure that the medium-term strategy plan reflects the needs of potential user groups, NEAR-GOOS agreed to open the consultation process to other competent organizations and bodies, and where appropriate set up working groups to ensure the necessary scientific and technical input to the process.

A crucial element of the strategy planning exercise is to arrive at a common understanding of what is to be achieved within the next five years. On the one hand, such an understanding should be guided by the overall long-term goals of NEAR-GOOS as laid down in its initial implementation plan. On the other hand, it should be driven by the practical considerations and constraints that ultimately determine the various steps that needs to be taken, what data can be contributed, for what purpose and within what timeframe.

Since NEAR-GOOS has so far concentrated on establishing an effective mechanism for data exchange among the countries involved, the present development, in essence, marks the commencement of a second phase. The Committee hopes to complete the medium-term strategy plan before the Fifth Session of IOC/WESTPAC Sub-Commission in the fall of 2002. Meanwhile, the Committee also agreed to continue their efforts to improve the basic data exchange mechanism that forms the basis of NEAR-GOOS.

All in all, the picture emerges that NEAR-GOOS is making steady progress. Data contribution to and retrieval from the regional and national NEAR-GOOS databases has increased considerably over the past year. NEAR-GOOS also started to report sea-level data and a variety of other data online. The databases are currently all accessible via the Internet. The countries have moreover strengthened the inter-agency coordination at the national level, which in due course should provide a sound basis for the further development of NEAR-GOOS in the years to come.

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SUMMARY REPORT

1. OPENING

1 The Fifth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS) was called to order by its Chairman, Prof. Zhouwen Yu, at 09:15 hours on Thursday 7 December 2000, at the Olympic Parktel in Seoul, Republic of Korea.

2 The Chairman welcomed all the participants and expressed his appreciation to the Korean Government and its Ministry of Maritime Affairs and Fisheries for hosting the meeting. He subsequently thanked the staff of the ministry for the excellent local arrangements. He further thanked the Secretariat, Mr. Maarten Kuijper, IOC Regional Secretariat for WESTPAC and Mr. Tsuyoshi Shiota of the IOC GOOS Project Office, for their hard work in preparing for the meeting. He further informed the meeting that apologies were received from Dr. Hong Wang and Dr. Evgeny Karasev who were unable to attend. Dr. Karasev has replaced Dr. Alexander Tkalin as new member of the Coordinating Committee. Finally, he welcomed the representatives of PICES and the UNDP/GEF Tumen River Project as official observers to the meeting.

3 At the invitation of Prof. Zhouwen Yu, the Director-General of the Marine Policy Bureau of MOMAF, Mr. Yong-woo Lee delivered his welcoming address. Mr. Yong-woo Lee made reference to the need to understand the ocean through a comprehensive system of observations, both at the global and regional level. The NEAR-GOOS pilot programme has proven to be a useful framework for such observations in the Northeast Asian region and considerable progress has been made over the past few years. More needs to be done however requiring the support and active participation of NEAR-GOOS member states. He then expressed the hope that the meeting would contribute to an improvement of our understanding of ocean phenomena, and that further development and practical applications will ensue. He concluded his address by wishing the participants a productive meeting and a pleasant stay in the Republic of Korea.

4 Prof. Keisuke Taira, Chairman of IOC/WESTPAC, Director of the Ocean Research Institute, University of Tokyo, concluded the opening. He thanked on behalf of the Executive Secretary of the IOC, Dr. Patricio Bernal, Mr. Yong-woo Lee and his staff for organizing the meeting. He commented on the development of NEAR-GOOS that as one of the early programmes under GOOS is already celebrating its 5th Session of the Coordinating Committee. He then elaborated on the latest developments relating to the GOOS modules as well as those within the context of POGO. Finally, he thanked the secretariat and MOMAF for all the preparatory work.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF AGENDA

5 The Chairman 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

6 The Delegate of the Republic of Korea nominated Mr. Naoyuki Hasegawa as the Rapporteur and the Delegate of China seconded this proposal. Mr. Hasegawa was designated as the Rapporteur.

2.3 WORKING ARRANGEMENTS

7 The Technical Secretary of the Session 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.

8 The Representative of the Local Organizing Committee informed the Session on local

arrangements.

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

3.1 REPORT BY THE CHAIRMAN

9 The Chairman reviewed the progress made in NEAR-GOOS since the Fourth Session of the Committee. He noted the continued development of NEAR-GOOS as a significant contribution toward the establishment of GOOS at a global scale. The regional databases, operated by JMA and JODC respectively, continued the service of providing data and data products to a variety of users from both within and outside of the NEAR-GOOS region. Aside from the regional databases, NEAR-GOOS has established national databases that serve as data-sharing platforms for domestic users and provide input to the regional databases. An open data policy supported by all the governments and the inclusion of real-time data are considered strong attributes of the NEAR-GOOS system.

10 He further noted the continuation of the training courses, organized and hosted by the JODC, and the associated research programmes of ORI, while emphasizing the strengthening of the NEAR-GOOS national programmes, notably in the Russian Federation and in the Republic of Korea. Collaboration with PICES has also been strengthened.

11 Despite the progress made, NEAR-GOOS still faces some challenges, among which the inclusion of other parameters, the increase in data volume and the addition of data products. In light of these challenges, whilst recognizing that these are long-term goals, the chairman concluded that:

(i) with the support of the governments, NEAR-GOOS needs to expand the variety and volume of data in its databases;
(ii) NEAR-GOOS needs to be more widely promoted, possibly with the publication of a new brochure; and
(iii) collaboration among member states should extend beyond data exchange alone and might include the preparation and exchange of data, modelling and forecasting products, exchange in marine monitoring technology, cooperation in oceanographic research and the sponsoring of NEAR-GOOS workshops.
(iv) collaboration with other programmes such as PICES, CREAMS and others should be strengthened.

12 As a first step, Prof. Yu suggested to have a meeting of the IOC focal points in each of the countries for the promotion of NEAR-GOOS activities. Mr. Hasegawa thanked Prof. Yu for the analysis and comprehensiveness of the report.

3.2 REPORT BY THE TECHNICAL SECRETARY

13 The Technical Secretary provided a report on activities carried out by the Secretariat, but first expressed his appreciation to all the participants of the Fourth Session for their assistance in completing last year's summary report.

14 He noted the considerable progress made in the establishment and upgrading of the various databases in each of the countries, and the continued support from the respective governments. In view of an ever-clearer concept of what the global ocean observing system will look like, NEAR-GOOS is steadily moving in the right direction.

15 The Technical Secretary subsequently argued for the need for a medium-term strategy plan by referring to the goals set by NEAR-GOOS in its initial implementation plan. To this end, he also mentioned the discussion paper (Annex IV) that was specifically prepared for the meeting hoping that it would bring about the necessary discussion. He expressed his wish that the discussion on a medium-term strategy plan would set the stage for a consultation process through which members can seek advice from relevant scientists, policymakers and organizations, ultimately with a view to producing a design concept of

NEAR-GOOS for the years to come.

16 Finally, he elaborated on the various activities carried out by the Secretariat, those being:

(i) Consultations with the IOC Russian focal point with a view to encourage the country's representation in NEAR-GOOS meetings, and the additional release of data from ROSHYDROMET. It is highly regrettable that despite this effort, the country has not been able to support the travel of its CC-members;
(ii) Preparation of a proposal for the organization of a workshop on 'NEAR-GOOS ocean environment forecasting', based on a concept proposal prepared by the chairman and Dr. Huang Daji of SOA. The workshop is scheduled to be held in conjunction with the Fifth IOC/WESTPAC Scientific Symposium in Seoul, 27-31 August 2001;
(iii) Discussion of NEAR-GOOS matters at the occasion of the Thirty-third IOC Executive Council Meeting in June 2000. The discussion was helpful in establishing the good collaboration with the Korean Ministry of Maritime Affairs and Fisheries that has led to the CC-meeting;
(iv) Discussion with PICES about their possible co-sponsorship of the 'NEAR-GOOS Ocean Environment Forecasting Workshop'. An indication has been received from the Executive Secretary of PICES that they are willing to support the travel expenses of a few young scientists;
(v) Preparation of a presentation on NEAR-GOOS in the Monitor Task Team Workshop held in conjunction with the PICES Annual Meeting held in Hakodate, 20-21 October 2000. Aside from collaborating with NEAR-GOOS, PICES is particularly interested in the development of a pilot project for the Living Resources Module of GOOS in the Northern Pacific region;
(vi) Invitation to the Democratic People's Republic of Korea to formally consider joining NEAR-GOOS with no response to the request received so far;
(vii) Discussion of the collaboration with NOWPAP at the occasion of the 6th Intergovernmental Meeting, held in Tokyo, 4-6 December 2000.

17 The Committee took note of the information provided in the reports of the chairman and technical secretary and expressed its wish to actively participate in the discussion of the medium-term strategy plan.

3.3 REPORT ON REGIONAL DATA BASE MANAGEMENT

3.3.1 Regional Real Time Data Base

18 Mr. Naoyuki Hasegawa, the RRTDB Manager, presented his report on the operation and activities related to RRTDB during the last intersessional period. Since September 1999, the number of the registered users has doubled, and by 1 November 2000, 91 users were registered as RRTDB user. Since June 2000, data from the PALACE floats deployed by JAMSTEC under the Argo programme are made available and uploaded to the RRTDB. Since March 2000, the frequency of access to the RRTDB web page has been around 2,000 hits/month. The number of FTP access increased when the RRTDB started to provide global GTS oceanographic data from 1,000-1,400 per month to 4000-5000 files per month. The most frequently accessed data type in terms of number of retrieved files is TESAC code data from the GTS, possibly because of the relation to the Argo programme.

19 Mr. Hasegawa proposed to discontinue the File Transfer Protocol put mode for security reasons but ensured that this would not affect the way that the RRTDB provides the data. The committee accepted this proposal. Some committee members and observers wished to be informed about changes in the real time data management. Mr Hasegawa explained that the announcement was usually made by email, and it was proposed that he would examine this process carefully, and that these users check if the registered email addresses are still valid.

20 Several Committee members suggested that the RRTDB should extend the data that it provided to more environmental parameters and to processed satellite data. Several Committee members and observers who use the RRTDB exchanged views and information with Mr Hasegawa on technical issues concerning the data provided by RRTDB. It was agreed that Mr Hasegawa would examine some of the detailed issues

after the meeting.

21 Major changes to the operation are as follows. (i) Provision of the data through http (October 1999); (ii) Provision of global data from the GTS (March 2000); (iii) Change to the web page structure (March 2000); (iv) Provision of climatological information on SST (March 2000); (v) Provision of global data and salinity in the common format (September 2000); (vi) Provision of observations from JMA research vessels (November 2000).

22 Prof. Yu thanked Mr. Hasegawa for his comprehensive report and for his efforts in the management of the real-time database.

3.3.2 Regional Delayed Mode Data Base

23 Mr. Toshio Nagai, the RDMDB Manager, reported on the operation of the RDMDB during the last intersessional period. JODC has continued to archive data, the majority of which currently represents tidal data. The total volume of data is steadily increasing with some 1,000 data records per month. Some 24 different types of data are being handled by the RDMDB. The latest addition concerns monthly XBT data from the Physical Oceanography Laboratory of Tohoku University in Japan.

24 As of November 2000, the total number of registered users amounts up to 79 organizations, of which some 52 organizations are Japanese. The number of users has increased slowly since the NEAR-GOOS RDMDB started operating in 1996.

25 Since the JODC is the responsible national oceanographic data centre for the IOC/WESTPAC Sub-Commission, it had sent a representative to the Sixteenth Session of the IOC Committee on International Data and Information Exchange (IODE) that was held in Lisbon, 30 October – 8 November 2000. That meeting had agreed to a proposal from the Malaysian delegate to initiate a so-called GODAR project in the WESTPAC region. Mr. Nagai expressed the hope that relevant agencies and organization of all the countries in the WESTPAC region, including those participating in NEAR-GOOS, would actively participate in the GODAR project.

3.4 REPORT ON DATA MANAGEMENT TRAINING COURSE

26 Mr. Nagai, as Director of JODC, reported on the Third and Fourth Training Course respectively held from 24 January to 4 February 2000 and from 27 November to 8 December 2000. The Committee expressed its appreciation to the capacity building measures undertaken by the JODC, particularly in view of its continued commitment to train selected candidates from the NEAR-GOOS member states.

27 A discussion ensued on the perceived needs for capacity building within the NEAR-GOOS context and how to better address those needs. The Technical Secretary made some general observations with respect to capacity building. He argued that the performance of any capacity building programme must be measured. Measurement should be more than the identification of the numbers of training workshops held and the number of participants trained. It is critically important to evaluate the benefit of a particular course in terms of the ability of the trainee to put the lessons learnt to practice after they return to their usual place of work. Within the context of NEAR-GOOS, this implies that on the one hand the countries should make a sincere effort in nominating those individuals who upon their return can be expected to actively contribute to GOOS strengthening at the national level. The course provider on the other hand should continually adapt the course to meet the evolving requirements of GOOS.

28 In this regard, JODC may wish to take into account the recently published IODE Resource Kit (http://www.aodc.gov.au/IODE/RK/), which includes data management tools, manuals and guidelines for training purposes. Trainees can bring the kit back to their respective countries and as such it can have a multiplier effect.

29 The Committee agreed to discuss the issue of capacity building in NEAR-GOOS in an

intersessional ad hoc working group building on a document to be prepared by the Technical Secretary which would elaborate on the various options available, including, in response to the comments made by Dr. Suam Kim, on the possibility of seeking additional funding support from APN. Mr. Nagai expressed his willingness to participate in the evaluation of capacity building needs and would seriously consider the implications thereof for the course that JODC organizes. The working group would report to the other CC-members following additional discussions at the occasion of the Fifth IOC/WESTPAC International Scientific Symposium to be held in Seoul, 27-31 August, 2001.

3.5 REPORT ON NATIONAL ACTIVITIES

3.5.1 China

30 Prof. Yu provided information on the status of the national NEAR-GOOS programme. The China national NEAR-GOOS Real-Time Database started daily operation in 1998 with data obtained from 14 coastal stations, one buoy (currently suspended for maintenance reasons) and VOS ships. Data considered are wave data, SST and marine meteorological data. The users of the data are mainly working in various forecasting agencies and in agencies responsible for the safety of marine operations of the coastal and offshore industries.

31 The Delayed Mode Database in China incorporates the data from the Chinese RTDB and an additional four other stations. Data from other NEAR-GOOS countries are added for the benefit for Chinese users. Visitors are mainly from universities and research institutions, both national and overseas. It is expected to increase the data in the database by including tide and tidal current prediction data from the major Chinese harbours. The user interface will be improved by the addition of graphic products using WebGIS technology and the improvement of network speed.

32 Marine monitoring in China will greatly improve in the next couple of years with the addition and upgrading of equipment and stations and through a modernized pilot monitoring system to be developed in Shanghai. China will also launch its first ocean satellite next year.

33 In April 2000, China held a national GOOS data user workshop where information about the users was collected. Since most of the oceanographic research and offshore industrial operations are located in coastal areas, near-shore environmental data, including physical, chemical and biological data are needed. Talks with other departments under SOA are underway to obtain more data other than physical data. For promotional purposes, the Chinese NEAR-GOOS programmes frequently report news about their activities on the network, and are working on a Chinese language brochure.

34 Dr. Dong-young Lee requested a clarification with regard to the tendency of individual Chinese agencies to charge for data. Prof. Yu responded that in theory data should be free in accordance with the government policy. In response to a question concerning the possibility of data exchange and collaboration with agencies from other line ministries, Prof. Yu replied that he would discuss this issue with relevant authorities.

3.5.2 Japan

35 The Japanese representative informed the meeting that the information on the status of the national NEAR-GOOS programme in Japan is included in the respective reports of the RRTDB and RDMDB, while NEAR-GOOS related research would be discussed under Agenda item 3.6.1.

3.5.3 Republic of Korea

36 The representatives of the Republic of Korea provided information on the status of the national NEAR-GOOS programme by referring to the recent establishment of the Korean Oceanographic Commission under MOMAF. This body has representatives of all relevant agencies, and includes sub-committees on Argo and the IOC/WESTPAC International Scientific Symposium. MOMAF is also in the process of developing a ‘Masterplan for Ocean Observing Systems’.

37 Dr. Dong-young Lee reported that progress on the database establishment had been slow. The Korean RTDB, currently designed for demonstration purposes, will operate under MOMAF with technical support provided by KORDI. He elaborated on the progress made to increase the real-time data, referring to the upgrading and linking of tide stations, the innovative deployment of new measuring equipment, technologies and platforms, the master plan for ocean-observing systems and research activities, symposia and scientific meetings related to NEAR-GOOS. Dr. Hee-dong Jeong informed the meeting about the status of the DMDB maintained by KODC. The database is currently being tested and contains a wide range of data.

3.5.4 Russian Federation

38 Prof. Victor Akulichev presented a report on the national activity of the Russian Federation. He named the major marine organizations, which provide information to NEAR-GOOS in the Russian Far East. The RTDB for NEAR-GOOS was created in 1998 by FERHRI and the DMDB was created in 1999 by POI FEB RAS. The information about the RTDB and DMDB for NEAR-GOOS is located on the web sites of FERHRI (*http://www.hydromet.com.ru*) and POI FEB RAS (*http://www.pacific.marine.su*) respectively.

39 The information contained in the DMDB for the NEAR-GOOS area maintained by POI includes an archive of deep-water measurements of temperature and salinity. The development of DMDB of POI was carried out with technical and financial support from the NODC, Washington, USA, within the context of the GODAR project. Further development of the NEAR-GOOS programme in Russia is closely related to the Russian Federal Programme "Integral System of Information about the World Ocean"(1999-2007). In the future the DMDB NEAR-GOOS is expected to serve as a part of the Russian oceanographic data centre of World Data centre-B.

3.6 REPORT ON RELATED PROGRAMMES IN THE NEAR-GOOS REGION

3.6.1 Progress of NEAR-GOOS Projects of Monbusho, Japan

40 Prof. Taira informed the meeting about the present project entitled 'Physical, Chemical and Biological Studies on Monitoring of Marginal Seas for Ocean Forecasting – A fundamental research project for NEAR-GOOS'. This project is funded under the 1999-2002 Scientific Research of Priority Areas scheme under the Japanese Ministry of Education, Science, Sports and Culture. The overall study aims: (i) to achieve real-time monitoring of volume transport and path of the Kuroshio, and chemical and biological parameters from ship and satellite data, and (ii) to understand oceanic processes through ocean forecasting of temperature, salinity, currents, chemical substances and biological productivity in the marginal seas. Prof. Taira gave a short introduction on each of the different subject areas under the project. The group is currently planning for a trial hindcasting exercise covering the months of September and October 2000.

41 Questions were subsequently raised regarding the Argo floats programme conducted in the NEAR-GOOS area and the release of data that become available under the research projects carried out with the support from ONR.

42 The committee felt that the research programme introduced by Prof. Taira was important to the future development of NEAR-GOOS. It particularly noted with interest the pilot experiment focusing on hindcasting the ocean state for the period of September and October 2000. It agreed that each Committee member should contact relevant organizations in their respective countries for the provision of observation data for the experiment, preferably through the data stream of the NEAR-GOOS delayed mode, or through any other means.

3.6.2 Recent Developments in China related to NEAR-GOOS

43 Prof. Jihui Yan provided a report on three national projects related to NEAR-GOOS that are currently in progress, those being: (i) the National project for upgrading the marine environmental monitoring system, focusing on increasing the number or quality of coastal stations, modern equipment and

voluntary observing ships; (ii) the Demonstration project off Shanghai for 3-D Marine Environmental Observation/Information Service System, using state-of-the-art technology and combined observations from a variety of platforms; and lastly (iii) the National Ocean Satellite Project for the launch of a Ocean Colour Satellite and the establishment of a number of satellite receiving stations. Prof. Yan said that some of the data obtained from the new stations would be reported to the national database.

3.6.3 Implementation of Argo Programme in the NEAR-GOOS area

44 Prof. Kuh Kim of Seoul National University gave a brief overview of the Argo Programme with particular reference to the NEAR-GOOS region. He noted that China, Japan and Republic of Korea were all committed to deploying Argo floats in various oceans of the world. Argo floats will monitor temperature and salinity profiles in many of the oceans. Few floats will be or have been deployed in the NEAR-GOOS region despite its potential to function as a miniature model ocean basin. The Republic of Korea will decide in February 2001 on the geographic location of the deployment of their respective buoys. An effort is underway at the international level to ensure adequate coverage of the oceans of the Southern Hemisphere.

45 With respect to the data stream, Mr. Hasegawa questioned which agency in the Republic of Korea would receive the Argo data first and who would have the responsibility to make them available via the Internet. Prof. Kuh Kim replied that this question had as yet not been answered.

46 Noting the loss of a number of Argo floats in the NEAR-GOOS area, Prof. Suam Kim suggested that markers and rewards could be used to improve the chances of recovery, whereas Dr. Tkalin added that this would also prove useful to the manufacturer. Prof. Kim responded that the issue is further complicated by the fact that the floats may drift in the Exclusive Economic Zones of foreign countries. Prof. Akulichev questioned the cost effectiveness of the programme if shipping time were to be included.

3.6.4 Implementation plan of real-time marine monitoring programmes of MOMAF, Republic of Korea

47 Dr. Dong-young Lee started his presentation by reviewing the EuroGOOS publications (available under URL: *http://www.soc.soton.ac.uk/others/eurogoos/about/publications/*) that might be useful for the Committee to read. Then he discussed the various components of operational oceanography, *i.e*. forecasting, nowcasting and hindcasting. More data are needed for the establishment of boundary conditions, and understanding the dynamics of the air-sea interface. Another possible option is the use of data models in the field of operational oceanography. Two categories can be distinguished, short-term operational forecasting and long-term forecasts, the latter of which is important to engineering work. Models in the public domain may greatly facilitate the further joint development in this field. The source codes of a number of high-end models have recently been released in the public domain, which would ultimately benefit a wide user community.

48 Dr. Dong-young Lee then continued with the national programme aimed at increasing the number of platforms in the country by using existing structures to the maximum extent including such structures as light houses, piers, wave buoys, ferry boats, light buoys, gas collection towers and others. These elements will be included in the master plan that is to be released by the end of the year 2000.

3.6.5 Related Programmes in the Russian Federation

49 Prof. Akulichev mentioned some of the NEAR-GOOS related programmes in the Russian Federation and explained that under the Russian Federal Programme entitled ‘the World Ocean’, 1999-2007, a number of research projects will be carried out that will focus on the Far Eastern Seas. The Russian Federation also collaborates within the framework of WESTPAC, PICES, CREAMS, NOWPAP and the Argo Programme.

4. CO-OPERATION WITH OTHER PROJECTS

4.1 FOLLOW-UP TO CC-4

50 The Technical Secretary introduced this agenda item by recalling the Fourth Session of the NEAR-GOOS Coordinating Committee in which a number of representatives of associated programmes and organizations participated. He limited his brief review to those projects and programmes that are outside of the GOOS framework.

51 With respect to the HAB programme, the Technical Secretary informed the meeting about the continued interest from the global HAB community in GOOS as highlighted in the recently published design plans of both the Coastal GOOS and HOTO modules. The ability to predict HAB occurrences will be an important component of the global GOOS programme, but more research needs to be done to elucidate some of the fundamental processes governing HAB. SCOR and IOC have embarked on a global research programme called GEOHAB that was established to better understand the global dynamics and ecology of harmful algae. He expressed the hope that in the future, NEAR-GOOS would offer a valuable tool for the prediction of HAB occurrences in the region.

52 The Ocean Dynamics and Climate programme of the IOC Sub-Commission for the Western Pacific had assisted the Secretariat in preparing a concept proposal for the NEAR-GOOS Ocean Environment Forecasting Workshop that is further discussed under Agenda Item 6. The project leader Dr. Huang Daji shall be involved in the further discussion leading to the workshop.

53 With regard to collaboration with NOWPAP, the Technical Secretary referred to Dr. Hee-dong Jeong's participation in the Fifth Intergovernmental Meeting held from 29-30 March 2000 in Incheon, Republic of Korea, in which he on behalf of the IOC and NEAR-GOOS reiterated the willingness to closely coordinate the activities with NOWPAP and its four Regional Activity Centres in the region. The National Fisheries Research Development Institute in Pusan has offered to co-host the Regional Coordinating Unit of the NOWPAP Regional Seas Programme. This will clearly benefit collaboration with NEAR-GOOS since the NFRDI is already hosting the national delayed mode database.

54 The Technical Secretary then informed the meeting about his participation in the Sixth Intergovernmental Meeting held in Tokyo immediately prior to the NEAR-GOOS Session. He commented that pending the confirmation of the other NOWPAP Member States, the proposed co-hosting of the Regional Coordinating Unit between Pusan and Toyama in Japan is likely to go ahead. He also informed the meeting of a resolution adopted by the NOWPAP Sixth Intergovernmental Meeting that specifically calls for closer integration of the Regional Seas Programme with the implementation of the Global Ocean Observing System and its regional components. The latter recommendation reflected the outcome of the Third Global Meeting of Regional Seas Conventions and Action Plans, Monaco, 6-11 November 2000.

55 Finally, the Technical Secretary informed the meeting about his visit to the Asian Office of Naval Research (ONRASIA) in Tokyo where he had met with Dr. Hassan Ali. The IOC/WESTPAC Secretariat and ONRASIA are discussing the organization of a workshop on SEA-GOOS to be held in conjunction with the Fifth IOC/WESTPAC Scientific Symposium, 27-31 August 2001.

56 The Committee appreciated the efforts of the Technical Secretary to ensure collaboration with the various organizations, programmes and projects concerned.

57 Mr. Hasegawa reported on his communication with Dr. Harashima on HOTO related activities in the NEAR-GOOS region. Dr. Harashima is currently involved in three projects that are relevant, those being: (i) the use of ships of opportunity for environmental monitoring using ferries; (ii) the development of an integrated automated sensor in real-time environmental modelling, and (iii) a workshop on Environmental Monitoring between Asian Countries. The proceedings of the latter are available from the Technical Secretary.

58 The Committee also expressed thanks to Mr. Hasegawa for his efforts to collaborate with the GTSPP who are conducting the quality control on GTS data.

4.2 GOOS

59 On behalf of the Director of the GOOS Project Office, the Technical Secretary provided information on recent significant developments within GOOS that are relevant to NEAR-GOOS. The scientific and technical advisory panels of the global programme have recently been restructured along two major themes, those being:

(i) the Ocean Observations Panel for Climate (OOPC) focusing on global open ocean monitoring and modelling, and primarily interested in assessing and predicting climate patterns, global weather patterns and the impact of climate change. An important achievement of this panel, which is co-sponsored by GOOS, GCOS and the WCRP, was the organization of the International Conference for the Ocean Observing System for Climate (OceanObs99) which took place in St. Raphael, France, October 18-22, 1999. This meeting addressed the collective needs of both research and operational oceanography. The meeting produced a comprehensive statement that is available at: *http://www.bom.gov.au/OceanObs99/Papers/Statement.pdf*. OOPC will also be the panel that corresponds to the Argo and GODAE projects.

(ii) the Coastal Ocean Observations Panel (COOP) was formed in the summer of 2000 by the amalgamation of three former advisory panels that dealt primarily with aspects of coastal seas, namely the Coastal, Health of the Ocean and Living Marine Resources Panels. In the transformation continuity was kept by retaining selected members of each of the former panels on the new body. The principal COOP outputs are the three Strategic Design Plans produced by the Coastal GOOS, LMR and HOTO modules of GOOS. These design plans will be useful to the NEAR-GOOS community in its effort to draw up a medium-term strategy plan.

60 A GOOS Regional Policy was developed for approval by I-GOOS-V (June 2001), and it is available through the GOOS web site. The policy was drawn up in response to the proliferation of new programmes and projects and should ensure coherence of these individual building blocks as part of the global GOOS programme. The regional policy also has implications for NEAR-GOOS and it is suggested that the CC-members take note of the policy and the GOOS principles as a guideline for the further development of NEAR-GOOS.

61 The coordination between NEAR-GOOS and the GOOS Project Office has been improved through Mr. Hasegawa's membership to the GOOS Steering Committee. One of the items brought up in that meeting was GLOSS and the request from the Russian delegation in the Executive Council meeting to upgrade and renew tide gauges in the far-eastern Russian Federation bordering the NEAR-GOOS area and adjacent seas. The Seventh Meeting of the Group of Experts will be held Hawaii in April 2001. It was further noted that sea-level stations could be used for the monitoring of additional parameters.

62 Mr. Hasegawa followed up on his attendance in the GOOS Steering Committee meeting, and informed the Committee about the latest developments with regard to J-DIMP, which was downgraded to a task group with the specific task of reviewing the Global Observing System Information Centre (GOSIC) operated by the University of Delaware. A Data Management and Information Plan was prepared by Dr. Wilson and will soon be finalized. It is available as document no. 15 on the provisional list of documents web site for the Third Session of the GOOS Steering Committee (*http://www.ioc.unesco.org/goos/GSC-III_doclst.html*). The plan is useful as a general guideline. In addition, there will be a data policy guideline produced by a task team under IODE.

63 Mr. Hasegawa further commented on the release of sea-level data. JMA would not have any objections but wishes to make sure that such reporting does not duplicate the efforts of existing institutions such as the Tsunami forecasting centre.

64 The GSC Meeting was highly appreciative of NEAR-GOOS because of its free and open data policy. This was also reflected in the final statement of the OceanObs99 Conference in St. Raphael, which notes the introduction of a new paradigm for oceanographic data systems, one where rapid dissemination and wide

sharing is the norm, not the exception.

4.3 OTHER ORGANIZATIONS OR PROJECTS

4.3.1 UNDP/GEF Tumen River Project

65 The representative of the UNDP/GEF Tumen River Project, Dr. Alexander Tkalin provided information to the Committee on this programme. The Tumen River Project is a potential user of NEAR-GOOS. The programme revolves around the so-called TumenNet that wishes to tackle problems of pollution and loss of biodiversity in the region. Four countries are involved in the programme and it is hoped that the Democratic People's Republic of Korea will join in the future. NEAR-GOOS provides a good model to TumenNet for data sharing. The Committee thanked Dr. Tkalin for his continued interest in working with NEAR-GOOS.

4.3.2 PICES

66 The representative of PICES, Prof. Suam Kim expressed on behalf of the Executive Secretary of PICES his appreciation for receiving the invitation to attend the Fifth Session of the NEAR-GOOS Coordinating Committee. PICES hopes that collaboration between the two organizations will lead to mutual benefit. He further informed the meeting that the PICES Science Board at the occasion of the Ninth PICES Annual Meeting had approved co-sponsorship of the NEAR-GOOS Ocean Environment Forecasting Workshop, subsequently followed-up on by the Governing Council who approved the proposal by offering travel support to a number of young scientists and experts from PICES member states.

67 In 1999, PICES already discussed closer collaboration with GOOS through the MONITOR Task Team. One of the GOOS related programmes under PICES concerns the Continuous Plankton Recorder, which is towed behind commercial ocean liners operating on the routes California – Gulf of Alaska and California – Japan.

68 PICES has expressed the following wishes for its collaboration with NEAR-GOOS:

(i) that NEAR-GOOS considers adding biological and chemical parameters;
(ii) that NEAR-GOOS considers the provision of time series for global carbon cycles;
(iii) that NEAR-GOOS allows PICES members access to data; and
(iv) a clarification as to how NEAR-GOOS monitoring of marginal seas links up to the Pacific Basin Scale Monitoring, for instance of the Western Pacific Gyre.

69 The chairman assured the PICES representative that anyone can access NEAR-GOOS data free of charge and the Committee expressed its appreciation to the offer of PICES to provide co-sponsorship to the Ocean Environment Forecasting Workshop.

5. MEDIUM TERM NEAR-GOOS STRATEGY PLAN

70 The Technical Secretary informed the Committee about the need for a medium-term strategy plan, by referring to the discussion paper (Annex IV) that was prepared in preparation of this agenda item. A major emphasis of NEAR-GOOS in its first five years of operation was directed towards solving problems of communication, processing, archiving and product generation while concentrating on a limited set of parameters. Within the framework of NEAR-GOOS, the participating countries have developed a number of databases that incorporate different types of data with varying formats and QA/QC. At the Third Session, the Committee recognized the need for a more coherent approach in data management and suggested that the database managers study the possibility of common formats and QA/QC procedures. In the subsequent Session, the Committee agreed to expand the datasets to include more biological and chemical parameters, and to pay more attention to the specific needs of users. The implication of these decisions is that NEAR-GOOS is evolving beyond the initial stage of data exchange towards a more integrated and

comprehensive ocean observing system. Such a development warrants a strategy that establishes clear priorities and a realistic time frame for the further development of NEAR-GOOS in the years to come.

71 The task of the Committee is to provide a direction for the continued development and integration of NEAR-GOOS in light of the increasing needs to develop NEAR-GOOS as a system designed and implemented as an end-to-end system, from measurements to the timely distribution of products. This direction, as to be elaborated within the 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.

5.1 SCOPE AND NATURE OF STRATEGY PLAN

72 The Technical Secretary provided an introduction to the discussion paper (Annex IV). The Committee was requested to take note of the information and provide guidance and advice on an appropriate mechanism to pursue the development of the medium-term strategy plan. To this end, the committee agreed to the following:

(i) that a medium-term strategy plan is indeed necessary;
(ii) to commit time and effort to working towards the elaboration of a medium-term strategy plan;
(iii) to finalize the elaboration of the plan before the fall of 2002 for subsequent submission to the Fifth Session of the IOC/WESTPAC Sub-Commission;
(iv) and to include in the consultation process other competent organizations as appropriate.

73 To facilitate the process, it was suggested that the Technical Secretary prepares a skeleton strategy paper with a review of critical issues to be solved, and present this to the CC-members.

5.2 DATA GATHERING: FILLING IN THE GAPS

74 The Technical Secretary introduced this section of the discussion paper. Three elements, namely the inclusion of additional parameters, the geographic scope and the implications of new data gathering technologies were discussed. The Committee took note of the information provided and started a preliminary discussion on the issues presented.

75 In response to a question of the PICES representative, Prof. Suam Kim, CC-members explained the rationale behind selecting the NEAR-GOOS area. NEAR-GOOS is a pilot project and wishes to concentrate on the East Asian marginal seas shared by the four countries, thus avoiding having to consider large basin scale processes and currents. This notwithstanding, a wide variety of data from the Pacific region are regularly reported to the NEAR-GOOS databases.

76 Dr. Tkalin presented a close review of some of the parameters that might be considered, with particular attention paid to how these data are gathered in scientific cruises. He proposed that such data could possibly be reported to the real-time database alongside the temperature and salinity data. He further mentioned the possibility to treat JGOFS data in a similar fashion, following earlier comments made by Dr. Taira and Mr. Nagai.

77 Several perspectives and suggestions were given on the nature of data to be included, including ocean colour data (SeaWiFs) as these become freely available, the problem of accessing data collected and maintained by other departments or line agencies, and considerations of the importance of knowing how environmental data are processed and can be utilized by the user community.

78 The Committee agreed that the proposed workshop on ‘NEAR-GOOS Ocean Environment Forecasting’ discussed under Agenda Item 6 might provide a suitable forum for the discussion of the type of parameters to be included in NEAR-GOOS and the feasibility thereof.

79 The discussion that followed highlighted the dilemma that the inclusion of environmental parameters depends on the users, but in order to attract such users you have to provide data first. One suggestion was to include as many data as possible whilst realizing that gaining access to environmental datasets may be a difficult problem in some of the Member States. A letter requesting permission for the use of particular data from the Executive Secretary IOC may not be enough. The Committee agreed that NEAR-GOOS might first wish to arrive at a conclusion of what parameters to include on a theoretical basis, and then pursue the acquisition of such data at the national level, recognizing the difficulties involved. The discussion of what parameters to include should take into consideration the documents prepared by other bodies and organizations (e.g. EuroGOOS) and the expert advice of relevant scientists in each of the countries.

80 The Committee requested the Technical Secretary to prepare an initial document for consideration by the CC-members and competent bodies or organizations. This document should describe the various physical, biological and chemical parameters concerned and the available formats in which they are reported and several of the new technologies that are available. Further discussion on this item is foreseen during the NEAR-GOOS Ocean Environment Forecasting Workshop in Seoul, 27-31 August 2001.

5.3 DATA PROCESSING, QUALITY CONTROL AND DISSEMINATION

81 The Technical Secretary introduced this section by referring to the corresponding paragraphs in the discussion paper. The discussion covered uniform data formats, streamlining data management procedures, and quality control and quality assurance.

82 The manager of the RRTDB provided additional information on the QA/QC carried out on NEAR-GOOS data as part of the Global Temperature and Salinity Profile Programme (GTSPP). He noted that the collaboration with the GTSPP is still in an experimental phase. JMA started to provide climatological statistics for the users of the QA/QC to enable users to conduct their own user-specific QA/QC.

83 Mr. Hasegawa further mentioned the considerable effort of JMA in converting all the temperature, wind and salinity data in common data formats. It is important to realize that NEAR-GOOS has agreed on a common format for these parameters. In case that the data formats and data processing techniques adopted by JMA are deemed unsatisfactory, he would appreciate to receive comments from the CC-members and other users. For the time being he argued that NEAR-GOOS should build on what is available.

84 The Marine Information Research Centre in Japan is developing QA/QC software with JODC, the host of the RDMDB. Currently JODC uses quality control software developed by that centre. JODC could also function as an intermediary in relation to the developments within the context of IODE.

85 Dr. Dong-young Lee proposed to encourage the data providers and processors to make their data more readily available. This would be beneficial for operational purposes. Mr. Hasegawa responded by saying that in general data providers are reluctant to provide their data, including sea-level data, without the necessary QA/QC, particularly if such data will be archived in other databases.

86 The Committee expressed its appreciation to the considerable efforts made by the RRTDB and RDMDB and associated databases in the conversion of data formats.

5.4 DATA PRODUCTS, VALUE ADDING SYSTEMS AND SERVICES

87 The Technical Secretary provided a short presentation to introduce this section of the discussion paper and invited the Committee to comment on the information provided.

88 Dr. Dong-young Lee encouraged the CC-members and observers to consider the documents published by EuroGOOS. The Commission agreed to consider such documents, as well as other documents

produced by the GOOS Project Office and other relevant bodies with a view to analyse and adapt the findings as appropriate for use in the deliberations leading to the medium-term strategy plan.

89 The Technical Secretary explained the concept of user profiles, and proposed to the meeting that the CC-members might consider drawing up such an extensive list with the assistance of the Technical Secretary. The Technical Secretary will use the information contained in the C-GOOS Design Plan and relevant EuroGOOS documents. The CC-members are asked to complete the information on specific agencies and institutions in their respective countries.

90 Mr. Hasegawa suggested clearly delimiting the mandate of NEAR-GOOS to the non-commercial domain. He emphasized that NEAR-GOOS should not duplicate the work conducted by existing agencies in each of the countries. Such conflicts of the operational mandate should be avoided. On a separate point, Mr. Hasegawa commented that the global ocean data assimilation experiment is applicable. He further suggested using the 'NEAR-GOOS Ocean Environment Forecasting Workshop' as a useful forum for the review of science and technology in relation to operational forecasting.

91 In terms of shared tools and as a service to the NEAR-GOOS community, Mr. Hasegawa noted that JMA wishes to make available a programme that allows for reading NEAR-GOOS real time data in the common format. The Committee appreciated the offer of the JMA. In this context, the Technical Secretary also pointed to the IODE Resource Kit that contains useful conversion programmes. Dr. Dong-young Lee elaborated on the use of shared models and explained how a large number of high-end models that are currently available in the public domain might be useful to NEAR-GOOS.

5.5 INFRASTRUCTURE AND MANAGEMENT

92 The Technical Secretary introduced this section of the discussion paper. He considered the need for the Committee to review the arrangements that govern the decision-making process in the context of NEAR-GOOS, including the composition of the Coordinating Committee, the national GOOS consultation mechanisms, promotion of NEAR-GOOS and the linkages to the scientific community.

93 In the subsequent discussion, it became clear that the Committee, whilst recognizing the need for such an assessment, would prefer to continue the current membership of the Coordinating Committee. It was argued that although a discussion has started on the next phase of NEAR-GOOS, still much remains to be done under the initial phase that focuses on establishing data exchange. Moreover it was expressed that there is a risk of loosing the original concept of the NEAR-GOOS being a pilot project if too many people are involved.

94 Prof. Taira returned to the issue of value-added products and made the observation that while the Committee is discussing expansion in terms of the number of parameters or through value added products, the present operational phase is still concentrating on collecting and providing the data. The main emphasis of NEAR-GOOS is and will remain for some time the provision of data. This should be reflected in the composition of the Coordinating Committee.

95 Following the suggestion of Dr. Dong-young Lee, the Committee subsequently discussed the possibility of having loosely formed working groups under NEAR-GOOS that address specific questions of the operation of NEAR-GOOS and the underpinning science. The Committee agreed that such working groups could be formed on an *ad hoc* basis, composed of experts in a certain field that understand and support the overall objectives of NEAR-GOOS. Working groups may be formed to support the process of developing the medium-term strategy plan and might be asked to prepare short papers that facilitate the discussion. The experts in these working groups can use existing forums, both at the national and international level.

5.6 PROMOTION OF NEAR-GOOS

96 The Chairman introduced this item, inviting suggestions from the floor on the promotion of

NEAR-GOOS given the fact that NEAR-GOOS is expanding into other areas. The Committee should consider the kind of activities to be conducted by NEAR-GOOS and consider the time frame, for instance activities in the field of numerical simulation and marine environmental forecasting.

97 Dr. Dong-Young Lee suggested that considering the limitation of funds for promotional activities, CC-members should make their best effort to seek additional financial and political support, to ensure the necessary input from scientific experts and to further encourage the provision of data.

5.7 OTHER ISSUES

98 Following up on Agenda Item 4.1, Dr. Hee-dong Jeong informed the meeting that the Sixth Intergovernmental Meeting of NOWPAP had discussed the possibility of organizing an expert meeting on the sub-programmes NOWPAP/1 and NOWPAP/3, tentatively to be held in Beijing in May 2001. The meeting would touch on cooperation with NEAR-GOOS.

99 Dr. Dong-young Lee provided some additional information on the GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia that is addressing marine pollution abatement, coastal zone management strategies and risk analysis assessments in the East Asian Seas.

6. NEAR-GOOS OCEAN ENVIRONMENT FORECASTING WORKSHOP

6.1 PROSPECTS FOR AN OPERATIONAL OCEAN PREDICTION SYSTEM IN THE NEAR-GOOS AREA

100 Dr. Suk provided an introduction to the Agenda Item by giving a presentation on the prospects for an operational ocean prediction system in Korean Waters. The ocean prediction system in Korea comprises satellite observations, ocean observations, and ocean buoys. He expressed his wish for close cooperation with NEAR-GOOS, and the integration of NEAR-GOOS products. Dr. Suk also elaborated on the Argo programme in the Republic of Korea. Mr. Hasegawa informed Dr. Suk that NEAR-GOOS temperature profiles are available in real time and delayed mode. Dr. Suk appreciated the information. He further added that more *in situ* observations would improve the quality of the data assimilation.

6.2 SCOPE AND OBJECTIVES OF THE WORKSHOP

101 The Fourth Session of the Coordinating Committee recommended holding a special workshop dedicated to the topic of ocean forecasting in the NEAR-GOOS region. The Technical Secretary elaborated on the preparations that were carried out so far by referring to the project proposal that was prepared by the secretariat for submission to the Japanese Funds in Trust through the IOC. Another version of this proposal was submitted to PICES to seek their co-sponsorship and to which PICES responded by agreeing to support the participation of several experts and young scientists in the workshop.

102 The Technical Secretary invited the participants to discuss practical considerations of the workshop, particularly in view of the fact that the meeting will be held in conjunction with the Fifth International Scientific Symposium from 27-31 August 2001.

103 The Committee felt that the workshop should extend one day beyond the duration of the Scientific Symposium or start one day in advance of the Symposium to allow for a thorough discussion of the subject matter. Particular attention should be paid to how the findings of the workshop could facilitate the preparation of the medium-term strategy plan.

104 Some time was devoted to discuss the title of the workshop. It was felt that the present title: ‘NEAR-GOOS Ocean Environment Forecasting Workshop’ is rather broad. However, since no agreement could be reached on an appropriate alternative, the Committee agreed to adopt the title as it is. The Committee agreed to the objectives listed in the proposal.

6.3 OUTLINE

105 Following up on the previous agenda item, the Committee was requested to provide additional ideas on topics that could be covered in the workshop, and suggest names of possible presenters. The Committee agreed to further continue this discussion by means of electronic correspondence.

7. ELECTIONS

106 The Technical Secretary reviewed the rules and practical arrangements for the election of the chairperson of the Coordinating Committee as they are presented in the Annex to Recommendation SC-WESTPAC-III.4 Document.

107 The Committee thanked Prof. Zhouwen Yu for his valuable contributions as Chairperson of the NEAR-GOOS Coordinating Committee.

108 The delegate of the Russian Federation nominated Dr. Dong-young Lee for the position of chairperson of the Coordinating Committee. The delegate of Japan seconded the nomination. Dr. Dong-young Lee was elected as the new Chairperson of the Coordinating Committee by acclamation.

8. DATE AND PLACE OF NEXT SESSION

109 The Committee was presented with the proposal from the Technical Secretary to hold the Sixth Session of the NEAR-GOOS Coordinating Committee in Perth, Australia, one day prior to the commencement of the Fifth Session of the IOC/WESTPAC Sub-Commission on the condition that the Australian Commonwealth Government would be willing to host that session. The objective of the next Session of the Coordinating Committee would be to review and adopt the finalized Medium-term Strategy Plan for submission to the IOC/WESTPAC Sub-Commission.

110 In view of the importance of face-to-face meetings in the elaboration of the medium-term strategy plan, some participants felt that a one-day meeting of the Coordinating Committee could well be organized after the Fifth International IOC/WESTPAC Scientific Symposium and the 'NEAR-GOOS Ocean Environment Forecasting Workshop' on 1 September 2001 in Seoul.

111 The Committee agreed to suspend the decision on the date and place of the next session, pending further consultation between the Technical Secretary and the relevant authorities in Australia and the Republic of Korea. A decision on this issue at the present session would be too premature.

9. ADOPTION OF THE SUMMARY REPORT

112 The Committee adopted the Summary Report in view of its submission to the Twenty-first Session of the IOC Assembly, July 2001.

10. CLOSURE

113 The Chairman closed the Session by 19:00 on Friday 8th December 2000.

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

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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
3.6 REPORT ON RELATED PROGRAMMES IN THE NEAR-GOOS REGION
3.6.1 Progress of NEAR-GOOS Projects of Monbusho, Japan
3.6.2 Recent Developments in China related to NEAR-GOOS
3.6.3 Implementation of Argo Programme in the NEAR-GOOS area
3.6.4 Implementation plan of real-time marine monitoring programmes of MOMAF, Republic of Korea
3.6.5 Related Programmes in the Russian Federation

4. CO-OPERATION WITH OTHER PROJECTS

4.1 FOLLOW-UP TO CC-4
4.2 GOOS
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4.3.1 UNDP/GEF Tumen River Project
4.3.2 PICES

5. MEDIUM TERM NEAR-GOOS STRATEGY PLAN

5.1 SCOPE AND NATURE OF STRATEGY PLAN
5.2 DATA GATHERING: FILLING IN THE GAPS
5.3 DATA PROCESSING, QUALITY CONTROL AND DISSEMINATION
5.4 DATA PRODUCTS, VALUE ADDING SYSTEMS AND SERVICES
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6. NEAR-GOOS OCEAN ENVIRONMENT FORECASTING WORKSHOP

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6.2 SCOPE AND OBJECTIVES OF THE WORKSHOP
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7. ELECTIONS

8. DATE AND PLACE OF NEXT SESSION

9. ADOPTION OF THE SUMMARY REPORT

10. CLOSURE

ANNEX II

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ANNEX III

ACTION SHEET OF NEAR-GOOS Co-ordinating Committee-V
(Seoul, 7-8 December 2000)

No.	Subject	Ref.	Action proposed	Responsible	Target date	Comments
1	RRTDB	20	- Discontinuation of the File Transfer Protocol put mode and review of notification procedures and expansion of the RRTDB to satellite data and environmental parameters. - Members will check the validity of their registered Email addresses	Mr. Hasegawa All members	When feasible (2001)	
2	GODAR	25	- CC-members to consider participation in a GODAR project for the WESTPAC region. - Mr. Nagai will inform the CC-members on the requirements for participation in the GODAR programme	All members Mr. Nagai	When feasible ASAP	
3	Data Management Training Course	28	- Mr. Nagai will consider incorporation of the IODE Resource Kit CD-ROM in future courses of JODC. - Technical Secretary will send copies of the CD-ROM to CC-members.	Mr. Nagai Technical Secretary	When feasible ASAP	
4	Data Management Training Course	29	- Preparation of a discussion paper on capacity building in NEAR-GOOS by the Technical Secretary in consultation with JODC - Mr. Nagai will provide a brief description of the JODC course outline and share information on the evaluation conducted by the trainees at the end of each course. Based on the information, he will also provide a plan for the modifications of the training course. - An ad hoc working group, comprising Mr. Hasegawa, Prof. Taira, Mr. Nagai, Dr. Suam Kim, Dr. Hee-dong Jeong, Prof. Yu, Mr. Shiota and Mr. Kuijper will work intersessionally on a needs assessment on NEAR-GOOS capacity building including recommendations for modifications for the present course organized by JODC.	Technical Secretary and JODC Mr. Nagai *Ad Hoc* Working Group on Capacity Building	When feasible ASAP August 2001	

No.	Subject	Ref.	Action proposed	Responsible	Target date	Comments
5	China National Databases	33	- Preparation of an English summary of the national GOOS data user workshop for distribution to CC-members	Prof. Yu	ASAP	
6	China National Databases	34	- Prof. Yu to discuss the issue of data exchange and collaboration with agencies from other line ministries with relevant authorities	Prof. Yu	ASAP	
7	Availability of Argo and ONR research data	41	- Mr. Hasegawa to check the availability of Argo data for the NEAR-GOOS programme	Mr. Hasegawa	ASAP	
8	Contribution of ocean observation data to ORI hindcasting pilot experiment	42	- CC members are to contact ocean observing organizations in the country for the provision of the ocean observation data for September and October 2000 for use in the pilot experiment of the 'Physical, chemical and geological studies on monitoring of marginal seas for ocean forecasting – A fundamental Research Project for NEAR-GOOS' through the NEAR-GOOS delayed mode data stream.	All members	ASAP	
9	Argo	44	- Mr. Hasegawa to investigate the possibility of having Japan deploy a limited number of Argo floats in the NEAR-GOOS area.	Mr. Hasegawa	ASAP	
10	Additional modes of cooperation under NEAR-GOOS	47 48	- The Committee members are to consider (i) sharing models on the NEAR-GOOS platform; (ii) sharing the operation of a single data buoy and (iii) the possibility of using ferryboats for monitoring on additional transects.	All members	When feasible	
11	GOOS Modules Strategic Design Plans	59	- Distribution of GOOS design plans as soon as they are published.	Technical Secretary	When feasible	
12	GLOSS	61	- CC-members to investigate the possibility of their respective countries to assist in the upgrading of sea-level stations in the Russian Federation.	All members	When feasible	
13	Tidal and bathymetric data	61	- CC-members to investigate the possibility of systematically adding tidal data and bathymetric data to the databases in their respective countries	All members	When feasible	
14	Medium-term strategy plan	72	- CC-members to contribute to the elaboration of the medium-term strategy plan, including the necessary consultation with relevant scientists and competent bodies and organizations	All members	Continuous – plan to be finalized by September 2002	

No.	Subject	Ref.	Action proposed	Responsible	Target date	Comments
15	Medium-term strategy plan	73	- Preparation of a skeleton strategy paper for distribution among CC-members	Technical Secretary	February 2001	
16	JGOFS data	76	- Mr. Nagai will assess the feasibility of including JGOFS data	Mr. Nagai	ASAP	
17	Data gathering	80	- Preparation of a short discussion paper to facilitate further comments and suggestions that require consultation with relevant scientists. - Members to discuss parameters and new technologies at the occasion of the Ocean Environment Forecasting Workshop.	Technical Secretary All members	ASAP August 2001	
18	Data quality control and processing	80 to 86	- CC-members to provide pertinent information (specific requirements, constraints, technical issues) on the subject of data quality control and processing to the Technical Secretary. - The Technical Secretary shall prepare a short discussion paper on the basis of these comments to be incorporated in the preparations for the medium-term strategy plan.	All members Technical Secretary	15 January 2001 ASAP	
19	Data quality control and processing	85	- 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	
20	Data products	88	- CC-members to take note of relevant documents. - Preparation of a list of useful documents.	All members Technical Secretary	When feasible	
21	User profiles	89	- Technical Secretary to draw up a list of user profiles to be complemented with data from CC-members on the corresponding agencies and institutions in the respective countries.	Technical Secretary All members	When feasible	
22	Models sharing	91	- Preparation of a feasibility study that further discusses the use of shared models on the NEAR-GOOS platform	Dr. Dong-young Lee	ASAP	
23	Medium-term strategy plan	95	- CC-members to consider establishing ad hoc working groups to support the process of developing a medium-term strategy plan	All members	Continuous	
24	Promotion of NEAR-GOOS	97	- CC-members will make their best effort to ensure contributions in terms of financial support for activities, scientific expertise, and the provision of data.	All members	Continuous	

No.	Subject	Ref.	Action proposed	Responsible	Target date	Comments
25	NOWPAP	98	- The Technical Secretary will provide CC-members with a list of the participants to the NOWPAP meeting of experts	Technical Secretary	ASAP	
26	NEAR-GOOS Ocean Environment Forecasting Workshop	103	- The Technical Secretary will consider an appropriate way of integrating the workshop in the Scientific Symposium and consult CC-members accordingly	Technical Secretary	ASAP	
27	NEAR-GOOS Ocean Environment Forecasting Workshop	105	- Consultation with CC-members on possible presenters in the workshop.	Technical Secretary	ASAP	
28	Next Session	111	- The Technical Secretary will consult with the necessary authorities on a possible time and venue of the next Session	Technical Secretary	ASAP	

ANNEX IV

THE FUTURE OF NEAR-GOOS: CHALLENGES AND OPPORTUNITIES

Maarten Kuijper
[IOC/WESTPAC]

DISCUSSION PAPER

Note

The views presented in the following discussion paper are those of the author. The purpose of the present paper was to highlight salient issues faced by the NEAR-GOOS community and to set the stage for a discussion on a medium-term strategy paper that is to be elaborated intersessionally

1. RATIONALE

NEAR-GOOS has been operational since 1996. Considerable progress has been achieved in setting up an effective oceanographic data dissemination system. This not only demonstrates a sincere commitment on the part of all the participating countries toward achieving the ambitious goal of an operational global ocean observing system, but also the readiness to prove that successful cooperation can be achieved at the regional level despite seemingly disparate socio-economic and political settings, thus setting a praiseworthy example.

Progress cannot be expected to be smooth. NEAR-GOOS demands an integration of efforts in oceanography of a scale never seen before. At the national level, agencies with different mandates and philosophies have been asked to seek a common ground that enables efficient cooperation, while at the international level, countries have had to agree to an open data policy for marine data that has no precedence. Obstacles abound in the field of technology, but this notwithstanding, NEAR-GOOS has been successful in embracing the internet as an effective means of data distribution, whilst new technological developments continue to be tested for their usefulness in a NEAR-GOOS context.

NEAR-GOOS constitutes a long-term commitment of the member states. As such, its success cannot be assessed on the mere basis of five years of operation, particularly so if these conclude the first phase of the project where emphasis has been on establishment rather than consolidation. Having said that, NEAR-GOOS is a continued process, and in that sense, has to adapt continuously to new developments that take place and different technologies and scientific discoveries that emerge. The presently achieved functional operational system may satisfy those that have contributed to its establishment, but it cannot be considered an end in itself. The NEAR-GOOS community needs to take stock of what it has achieved so far and what steps it can take to further improve and adapt the present system.

Against this background, I have written the present paper. In the following, I discuss the need for a medium-term strategy for NEAR-GOOS, drawing on an analysis of the many opportunities presented to the system on both the global and regional level. The paper concludes that until now, NEAR-GOOS has proven to be an excellent platform for the contributors of data, but less emphasis has been placed on the requirements of users, that is to say, to conform to a system designed and implemented as an end-to-end system, from measurements to the timely distribution of products. The NEAR-GOOS data community should expand or modify their contribution to better meet the needs of the NEAR-GOOS end users, e.g. by adding parameters to be monitored, improving quality assurance and control procedures, varying work practices to improve the long-term stability of the record, improve the timeliness of data and offer a range of forecasting tools. In order to fulfil these requirements, we need to identify the different options available, assign priorities accordingly and draw up concrete actions of how to confront them.

2. INTRODUCTION

GOOS was called for by Agenda 21 to aid in the sustainable management of seas and oceans. Recognizing that the oceans know no political boundaries, and that a country's coastal waters may be affected by events far away, there is an urgent need for countries to exchange data on their common coastal environment so as to acquire the spatial coverage needed as the basis (i) for a full understanding of the processes affecting the coast and climate, and (ii) for accurate forecasts of how conditions may change on a variety of time-scales (hourly, weekly, monthly, seasonally, and inter-annually).

NEAR-GOOS is one of the regional GOOS bodies focusing its efforts on the Northeast Asian region. Its Member States are the People's Republic of China, Japan, the Russian Federation and the Republic of Korea. These countries agreed to a common data exchange policy under the NEAR-GOOS framework.

NEAR-GOOS started its operation in the fall of 1996 upon the formal adoption of the NEAR-GOOS Implementation Plan and Operational Manual by the 29th Executive Council of the Intergovernmental Oceanographic Commission. During the last few years, a major emphasis of NEAR-GOOS operation was directed towards solving problems of communication, processing, archiving and product generation while concentrating on a limited set of physical parameters. The parameters considered in the initial phase are temperature, salinity, currents, winds and waves. The result of this initial phase is the establishment of an efficient data exchange scheme for the existing observing systems in the region. In the long-term, it is expected that the NEARGOOS system will expand in scope to better serve the overall goal of global ocean and climate monitoring and forecasting.

A large amount of oceanographic data has been contributed to the system by data gatherers, distributors and processors from a wide range of government agencies of the four member states. Each of these countries has assigned national data coordinators for the collection and subsequent dissemination of the data via the Internet. Access to the NEAR-GOOS data collection is free and open to anyone who is willing to register, whether this is a researcher in Canada or the Port Authority in Singapore.

3. NEAR-GOOS STRUCTURE

The NEAR-GOOS system operates through two different modes, a (near-) real time database and a delayed mode database. Each of the countries has set up such databases for the purpose of collecting national data. The databases are maintained by different mandated agencies. The Japan Meteorological Agency (JMA) and the Japanese Oceanographic Data Centre (JODC) carry out the aggregation of data at the regional level and thus function as the respective Regional Real Time Database (RRTDB) and Regional Delayed Mode Database (RDMDB).

An important component of the real-time data is constituted by the basic marine meteorological data that are collected by research vessels, buoys, merchant ships and other non-research purpose ships. The data of these ships and buoys are transmitted to oceanographic or meteorological services through the telecommunication satellites, or coastal radio stations for further distribution worldwide via the Global Telecommunication System (GTS). This is carried out under the auspices of the WMO and IOC in the framework of the existing Integrated Global Ocean Services System (IGOSS). The NEAR-GOOS regional real-time database retrieves these data for subsequent distribution among the NEAR-GOOS users.

The data exchange over the GTS has some limitations. Only a limited number of physical parameters can be exchanged and the data have to be written in a defined format. The NEAR-GOOS real-time database welcomes also data from other sources. The Internet ensures the timely dissemination of these data. Data are accepted in any format provided that the format is well documented. The regional real-time database reformats all data including the GTS data into agreed formats.

The data in the real-time databases allow for daily mapping of sea conditions. Data are kept up to a period of 30 days from the time of collection. After that time, the data are transferred to the delayed mode database and added to the long-term records. The delayed mode databases in each of the countries also make an effort of collecting historic datasets and data that are not collected in real time.

The nature of the cooperation in NEAR-GOOS is such that the system functions as a virtual platform of real-time and delayed mode databases. While each of the Member States maintains its own national datasets, they can also download relevant data from dedicated servers in the other countries. The regional databases in Japan provide a complete record of what is available. Users can choose to access the individual databases or the regional databases.

The NEAR-GOOS Coordinating Committee reviews the management arrangements of NEAR-GOOS on an annual basis. All the four member countries have nominated two members to the committee who represent the respective real-time and delayed mode databases in those countries.

4. THE FUTURE OF NEAR-GOOS

The basic concept of NEAR-GOOS and indeed GOOS as a whole is that of a unified network set up to systematically acquire, integrate and distribute ocean observations, and to generate analyses, forecasts and other useful products designed not only for the benefit of a wide user community but also driven by user needs. In order for the system to appeal to users and the supporting governments, measurements have to be routine, of high quality, cost-effective and the results should be available in a timely manner. As such, it is analogous to the World Weather Watch that underpins all weather forecasts, relying on cooperation between neighbouring countries in the collection and exchange of pertinent data.

The operational oceanographic and marine meteorological measurements made in GOOS are designed so as to provide:

(i) accurate descriptions of the present state of the sea and its contents, including contaminants and living resources;
(ii) continuous forecasts of the future condition of the sea and its contents for as far ahead as possible; and
(iii) long term data sets showing trends and changes including the effect of the ocean on climate and of climate change on coastal seas.

This raises various questions as to where NEAR-GOOS currently stands and how to improve its functioning. In the following I will attempt to look into these questions in more detail, by analyzing the different challenges ahead and proposing possible directions forward.

One way of evaluating NEAR-GOOS is by looking at the different functions it is meant to perform. The following broad functions are suggested:

1. Data gathering
2. Data processing, dissemination and distribution
3. Data products; models
4. Value adding systems and services
5. Infrastructure and management

5. DATA GATHERING

Currently, the NEAR-GOOS real-time component is focusing on a limited set of physical parameters, notably temperature, wind, waves, salinity and currents. These parameters were chosen on the grounds that

an internationally co-ordinated effort was already operational through the GTS. This would ensure a rapid increase in data reports to the system. Moreover, since they require little further processing or analysis they can provide useful information on the sea state at any given location on a near real-time basis.

Additional parameters that are considered in NEAR-GOOS include sea-level, dissolved oxygen and nutrients. Depending on the time needed to analyse and report these data, they appear in either the real time database or when it takes longer in the delayed mode database.

The NEAR-GOOS Coordinating Committee agreed in 1998 to expand the database to cover biological and chemical data. So far however, very few biological and chemical data have been reported to the system. One problem is that the data providers who already contribute to the system not necessarily maintain the environmental databases in each of the countries. Neither is it clear what particular biological and chemical parameters should be considered for inclusion in the databases. Regular assessment of the health of the ocean requires different parameters (e.g. certain contaminants such as cadmium, mercury, coeliforms etc.) than for instance the fisheries production (primary productivity, long-term records of plankton communities). This is further complicated by the fact that such data are not always available in one central location or because they are considered to be sensitive from an economic perspective (e.g. mariculture). Adding to this is the fact that such data are gathered with various degrees of accuracy using different methods and analysis techniques at widely varying intervals in time or space. Hence, there is a need to consider intercalibration and intercomparison exercises as a means to improve the quality of these data and to ensure meaningful information at the aggregate level.

Besides biological and chemical parameters, NEAR-GOOS may also wish to review coverage of pertinent physical parameters, which are currently not included or underreported. NEAR-GOOS could for instance considerably benefit from a baseline set of bathymetric data of the region or the regular reporting of sea-level data.

The geographic scope of the GTS data contained in the NEAR-GOOS system covers not only the NEAR-GOOS project area, but also much of the western North Pacific (20N – 90N, 110 E – 180 E). But data coverage is not uniform in the region. Some data are not included in the initial phase of the project, notably data from the Bohai Sea and the North Korean waters.

The monitoring of the world's oceans is greatly facilitated by the introduction of new technologies, in particular remote sensing technology, telemetry, acoustic thermometry, autonomous floats and drifters and multi-purpose platforms. Ocean colour, wind scatterometers and sea-level altimeters hold promise for accurate and large coverage of the oceans, including the NEAR-GOOS region.

Having said that, there is an urgent need for the NEAR-GOOS members to include more data from the wealth of remotely sensed data that is being produced by the rapidly growing number of ocean-observing satellites crossing the Northwestern Pacific daily. This need can be met by training more specialists in the use and interpretation of such data; by increasing the access of such specialists to regional satellite receiving stations in the various countries of the region and by linking these specialists together in the network. It is also important that remote sensing and *in situ* measurements are considered jointly. For instance, *in situ* observations of biological and chemical data are needed in order to calibrate SeaWiFS remote sensing satellite data.

Data gaps thus appear in terms of the parameters considered, technologies used and the area under observation. A concerted effort is needed to fill those gaps, taking into consideration the needs of the users.

Much can be achieved through cooperation at the national level. A case in point is the Japanese Fishery Agency that in 1997 agreed to participate in the Japanese working group on NEAR-GOOS, thus in effect doubling the quantity of data contained in the real-time database.

6. DATA PROCESSING, DISSEMINATION AND DISTRIBUTION

A new dimension has been added to the science and operational aspects of oceanography by the availability of the Internet and enhanced computing power. This allows for immediate and broad distribution of large quantities of data and easy access to the information available from even the remotest areas.

The operational agencies that gather the data have a significant role to play in ensuring the timely processing and distribution of data in the system via the respective national databases. The GTS system partly ensures timely delivery, but additional data are also reported to the NEAR-GOOS databases in a consistent and frequent manner. Real-time data exchange is however a relatively new concept to the oceanographic community. One cannot expect that the data producers in the region will all readily provide oceanographic data to the NEAR-GOOS databases in (near-) real-time. This despite of the fact that the NEAR-GOOS Operational Manual does offer clear guidance on how agencies can contribute and access data.

An important achievement of NEAR-GOOS was the agreement on an open data policy. Oceanographic data in NEAR-GOOS should be made available, free of charge, to all users who are interested in contributing and/or making access to the databases.

However, in order to encourage broad access in the initial phase of the project, NEAR-GOOS has so far put less emphasis on the uniformity in data formats and in the quality assurance and quality control procedures associated with each of the datasets.

In terms of data formats, the only requirement imposed on the data provider is the need for sufficient documentation on the contents and format of a data set. A discussion is underway to establish what uniform formats to use in the NEAR-GOOS system. Data contributed to the system through the GTS follow the WMO codes. But non-GTS data can take whatever form they have at present.

Similarly, it is understood that the data provider is responsible for the data quality control. At present, quality control and quality assurance is not guaranteed. This may have facilitated the start-up phase of the project but can hardly be expected to sustain the system in the long-term. One problem is that the quality assurance and quality control heavily depends on the ultimate use of the data. A wave forecaster working on a 100 km scale may have different requirements for the accuracy of the data than for instance a researcher working on a global circulation model. The NEAR-GOOS system should provide information to the users on the analytical and quality control procedures and other processing performed on a particular dataset. QA/QC procedures are a prerequisite if the NEAR-GOOS data sets are to be used to address certain specified problems. This poses a serious challenge to the NEAR-GOOS community, particularly with the anticipated addition of biological and chemical data.

The regional real-time database is transmitting some of the GTS data to the Marine Environmental Data Service in Canada for limited quality control within the framework of the Global Temperature and Salinity Profile Programme (GTSPP).

Over the last few years, all the member countries of NEAR-GOOS have set up dedicated websites for the databases that they maintain. The data that are kept in these national databases and the procedures of access vary from country to country. Registration procedures are necessary for some of the databases but should not prove to be an obstacle.

NEAR-GOOS should embrace the Internet as an effective means of providing access to the respective databases. Improvements in web design have made easy downloading and uploading of data possible. Rapid dissemination and immediate telecommunication from a platform via the databases to the user is within reach with improved satellite communications and the development of specialist data servers.

Being a member of NEAR-GOOS implies that the country should commit to establishing, maintaining, validating, making accessible and distributing high quality, long term data meeting internationally agreed

standards. The NEAR-GOOS data should be kept in suitable archives following appropriate procedures and criteria for data acquisition and retention, and should include information on data holdings. The overall challenge lies in processing the data to such a level that is generally suitable for the generation of operational products and for research.

7. DATA PRODUCTS; MODELS

An important premise of NEAR-GOOS in its initial phase was that the sole provision of the primary data would attract enough interested users to ensure that the data are put to use. It was up to these users to carry out the subsequent processing as deemed appropriate, be it as boundary conditions for models, or validation of forecasting tools, etc. The use of the data however has so far been limited. This is not surprising if one considers the results of a detailed survey carried out in the context of EuroGOOS. Here, only 20% of the respondents said that they required raw data. The vast majority of the users prefer some degree of processing or presentation.

In designing the NEAR-GOOS system to serve a given range of end-uses, it is important to know how the observation would be used, processed and combined with other observations to deliver an observational 'product' of value to the end users. NEAR-GOOS therefore needs to consider not only how observations should be made but also understand the steps and operational and scientific products (e.g. technology and models) required for their end use.

As a first step, NEAR-GOOS might consider drawing up user profiles, i.e. definitions of user categories with a list of agencies and institutions in each of the member states that fit the description and that might be considered a potential user. A number of existing GOOS documents offer examples of user categories with a description of the type of data and data processing needed. Subsequently, one has to present NEAR-GOOS to these potential users in order to engage them in a discussion of what they might want from NEAR-GOOS and what they might be willing to contribute.

The NEAR-GOOS Coordinating Committee has recognized the need for data products but has yet to discuss suitable products for inclusion in the system. The databases are currently still predominantly focusing on the archiving function. One problem is that different agencies or departments are mandated and have the expertise to carry out the advanced processing and modelling needed to deliver useful products to the user community. Such entities are reluctant to relinquish their operational mandate. In this regard, NEAR-GOOS can be expected to yield 'useful products' if the mutual benefit that can be achieved by effective collaboration among the various entities is made explicit. In line with the preceding section, NEAR-GOOS might at first wish to concentrate on the data delivery and pertinent basic processing and quality control, leaving sophisticated product delivery to specialized service providers from both the public and private sector. A parallel can be drawn with the World Weather Watch. This system does not produce the actual weather forecasts but merely provides essential information that meteorological offices can subsequently use to produce weather forecasts in their own countries.

Having said that, certain products such as models and forecasting tools can be added to the NEAR-GOOS without resulting in a competition with existing specialized agencies that support similar or more advanced systems. NEAR-GOOS should co-exist and interact cooperatively and to mutual benefit with the other systems. One could imagine the inclusion of forecasting tools and models that reside in the public domain and that demonstrate clearly the use of data. With the advance of computing power, modest forecasting and visualization tools can be used on the PC. Model sharing among the different users and data providers can also be pursued. Another important adaptation is the integration of datasets within NEAR-GOOS, particularly in view of the advent of coupled physical and ecosystem models.

NEAR-GOOS might wish to explore some of these concepts in a feasibility study with a view to better understand the possible contribution of such approaches to NEAR-GOOS and their respective advantages and disadvantages, particularly in terms of cost, perceived value to the user, and practicality to implement.

Another application of NEAR-GOOS data that holds promise is data assimilation. Data assimilation is a proven tool essential for atmospheric numerical prediction that is widely used in weather forecasting. The Ocean Observing Panel for Climate (OOPC) is leading the development of the Global Ocean Data Assimilation Experiment (GODAE) that is aimed at demonstrating the practicality and viability of routine, real-time global ocean data assimilation and prediction. It might be expected that the GODAE experiment would provide, for example, the global context for regional pilot experiments in NEAR-GOOS and EuroGOOS. GODAE thus holds promise as a vehicle to bring sophisticated products from data to users.

Valuable lessons can be learned if NEAR-GOOS researchers were to be involved in the GODAE experiment, and as such participation from the region should be encouraged. From an operational perspective, however, it may be too early to embark on such an ambitious undertaking. Instead NEAR-GOOS might wish to concentrate its efforts on technological developments that have more direct benefits.

8. VALUE ADDING SYSTEMS AND SERVICES

A critical aspect of the NEAR-GOOS system is the ability to deliver data from the networks to the users, in a timely fashion, and to then organize the data so that it can be brought to maximum effects for both research and operations.

The present NEAR-GOOS databases build on the experience accumulated in the respective host agencies. This has led to the development of separate user-interfaces for each of the individual databases that compromise the consistency of the NEAR-GOOS system as a whole. NEAR-GOOS might wish to consider drawing up a set of simple design criteria and a common logo, which the respective web masters who are responsible for the different homepages can use to organize the websites in such a way that they have a common feel to it. This might also work in the varying approaches (e.g. passwords) currently used to grant access to the databases.

The decorative aspects of the interface however represent only one aspect. Good data and information management systems add considerable value to data sets through enhanced quality, enhanced good data return, synergistic assembly of related data, enhanced utilization and uptake of gathered information, and more rapid feedback from user to provider. This requires a more careful examination of the present NEAR-GOOS data system as a whole.

The usefulness of the NEAR-GOOS system has to be made explicit to a wider audience. At first glance, the system may not seem to yield tangible outputs other than those where NEAR-GOOS data are used for research purposes, but with the gradual advancements foreseen in the technological and scientific field, it should be possible to generate broad support for the system.

An inherent danger of such an approach is that the applications or developments that are promised are not realized within the time or level of accuracy predicted. Generally speaking it can be said that, if allowed to develop, technological applications will find their use in operational oceanography. The development cycle for new technology is typically 10 years, and the transition from research demonstration to sustained operation may typically add another five years. Thus NEAR-GOOS should not be seen as a static data exchange mechanism but rather as a sustained long-term, systematically structured and quality controlled dataset continually changing and improving itself over time.

9. INFRASTRUCTURE AND MANAGEMENT

The initial establishment of NEAR-GOOS was driven by a desire to start international cooperation on a limited scale. The agreement on an open data exchange policy cannot be underestimated as an achievement in that respect, particularly in view of the disparity between the political and economic settings of the participating countries. Moreover, the capabilities and opportunities that are present or foreseen in the

NEAR-GOOS system depend fundamentally on a willingness to share and distribute information.

NEAR-GOOS constitutes in essence a virtual network where each of the countries have an equal opportunity to contribute to and benefit from the data maintained in both the real-time and delayed mode components of the system. This has proven to be a workable structure for cooperation among the NEAR-GOOS members.

But cooperation should not be limited to a network comprising only the different institutes that host the respective real-time and delayed mode databases in each of the NEAR-GOOS member countries. Effective collaboration is needed between data providers and the user community, be they from the private sector, government or research community. The user community should be the driving force behind the development of NEAR-GOOS. Cooperation between data providers at the national level is also important. NEAR-GOOS should function as a mechanism at the national level to foster operational data exchange and technological and scientific innovation. Ideally, such should be achieved through active and regularly meeting national GOOS working groups or their equivalents.

Neither should the cooperation be limited to the NEAR-GOOS area. NEAR-GOOS can benefit from development in other regions and sectors. Of particular merit are the lessons learnt in the EuroGOOS region or in US-GOOS. The participation of NEAR-GOOS in global research programmes such as GODAE, Argo and CLIVAR is particularly welcomed as this offers valuable opportunities for the development of data applications in the NEAR-GOOS system.

Along similar lines, NEAR-GOOS should encourage cooperation with PICES, NOWPAP, CREAMS and other complementary regional frameworks, particularly where these hold promise for valuable data (e.g. NOWPAP) and/or expertise (PICES, CREAMS). The latter parties, in addition to national research agencies and universities are also crucial in promoting and funding enabling research that drives the innovation in NEAR-GOOS. A good example is ORI's current research programme entitled 'physical, chemical and biological studies on monitoring of marginal seas for ocean forecasting – a fundamental research project for NEAR-GOOS' that is funded through the Scientific Research of Priority Areas, 1999-2002 programme of the Japanese Ministry of Education, Science, Sports and Culture. NEAR-GOOS should also seek an active partnership with the remote sensing community since the developments in the latter will strengthen NEAR-GOOS in its ability to provide operational oceanography to a wide audience.

In view of the above, NEAR-GOOS might consider discussing an appropriate mechanism to ensure the widest possible representation of GOOS interests at the coordinating committee level and at the national level. At present, the coordinating committee is composed of representatives of the respective real-time and delayed mode databases. Although observers are welcome to attend the coordinating committee meetings, there is no fixed consultation mechanism for such interested parties. Promotion of NEAR-GOOS activities is another aspect that needs to be considered. The support for the programme cannot be sustained through a limited group of users and data providers. NEAR-GOOS needs to advertise itself, not only to the scientific and operational communities in each of the Member States, but also to the general public at large.

10. CONCLUSION

After the initial years of consolidation, the time has arrived to put forward a strategy for the future of NEAR-GOOS. A strategic plan is essential if we are to have truly long term (sustained) observations, not just observations that benefit, and last during the course of, an individual's or group's research project. One of the important elements in this strategy is the perceived need for NEAR-GOOS to provide a range of tools and methodologies to data users that will foster an incremental use of NEAR-GOOS data in the field of ocean environment forecasting.

The development of a truly integrated operational forecasting capacity in the NEAR-GOOS region will take many years. Many hurdles have to be taken both at the national level as well as within an international context. NEAR-GOOS should seriously consider the requirements of the user community and the benefits to be realized from a more user-oriented output, including the identification of value-added processes to deliver

the required services. Until now, NEAR-GOOS has proven to be an excellent platform for the contributors of data, but less emphasis has been placed on the requirements of users, that is to say, a system designed and implemented as an end-to-end system, from measurements to the timely distribution of products.

For NEAR-GOOS this implies that the data contributors should expand or modify their contribution to better meet the needs of the NEAR-GOOS end users, e.g. by adding parameters to be monitored, improving quality assurance and control procedures, varying work practices to improve the long-term stability of the record, improve the timeliness of data and offer a range of forecasting tools.

11. ACKNOWLEDGEMENTS

The content presented in this paper benefited from a number of papers that were written specifically to discuss certain elements of the Global Ocean Observing System at large. For more information, readers are encouraged to consult the following papers:

IOC 1998. The GOOS 1998. IOC, Paris. 168 pp.
http://ioc.unesco.org/goos/Prospe98/contents.html
OceanObs 99 Conference Statement:
http://WWW.BoM.GOV.AU/OceanObs99/Papers/Statement.pdf
Fisher, J. and N.C. Flemming. 1999. Operational Oceanography: Data Requirements Survey. EuroGOOS Publication No. 12. Southampton Oceanography Centre, Southampton. ISBN 0-904175-36-7.
http://www.soc.soton.ac.uk/OTHERS/EUROGOOS/About/Publications/RequirementsSurvey.pdf

More information on NEAR-GOOS

Please consult the following URLs:

Japan:

NEAR-GOOS Regional Real-Time Data Base (RRTDB): http://goos.kishou.go.jp
NEAR-GOOS Regional Delayed Mode Data Base (RDMDB): http://near-goos.jodc.jhd.go.jp

People's Republic of China:

Real Time Data Base: http://www.nmefc.gov.cn/NEAR-GOOS/near-goos.html
Delayed Mode Data Base: http://near-goos.coi.gov.cn

Republic of Korea:

Real Time Data Base: http://near-goos.kordi.re.kr
Delayed Mode Data Base: http://www.nfrda.re.kr/kodc/english/index.html

Russian Federation:

Real Time Data Base: http://www.hydromet.com/project/near-goos/near-goos.shtml
Delayed Mode Data Base: http://www.pacific.marine.su/cdsdb/ngpdb/ngpdb.html

Intergovernmental Oceanographic Commission:

NEAR-GOOS Homepage: http://ioc.unesco.org/goos/neargoos.htm

ANNEX V

LIST OF ACRONYMS

Argo	Global Array of Profiling Floats (not an acronym)
APN	Asia-Pacific Network for Global Change Research
CLIVAR	Climate Variability and Predictability (WRCP)
COOP	Coastal Ocean Observations Panel
CREAMS	Circulation Research of the East Asian Marginal Seas
DMDB	Delayed Mode Data Base
EuroGOOS	European GOOS
FERHRI	Far Eastern Regional Hydrometeorological Research Institute (Russian Federation)
FTP	File Transfer Protocol
GEF	Global Environment Facility
GEOHAB	Global Ecology of Harmful Algal Blooms
GIS	Geographic Information System
GLOSS	Global Sea-Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GODAR	Global Oceanographic Data Archaeology and Rescue Project
GOSIC	Global Observing System Information Centre
GSC	GOOS Steering Committee
GTS	Global Telecommunications System (of WMO)
GTSPP	Global Temperature and Salinity Profile Programme
HAB	Harmful Algal Blooms
HOTO	Health of the Oceans
I-GOOS	Intergovernmental Committee for GOOS
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange Programme
JAMSTEC	Japan Marine Science and Technology Centre
J-DIMP	Joint Data and Information Management Panel
JGOFS	Joint Global Ocean Flux Study
JMA	Japan Meteorological Agency
JODC	Japan Oceanographic Data Centre
KODC	Korea Oceanographic Data Centre
KORDI	Korea Ocean Research and Development Institute
LMR	Living Marine Resources
MOMAF	Ministry of Maritime Affairs and Fisheries (of the Republic of Korea)
Monbusho	Japanese Ministry of Education, Science, Sports and Culture
NEAR-GOOS	North-East Asian Regional GOOS
NFRDI	National Fisheries Research and Development Institute (Republic of Korea)
NOWPAP	North-West Pacific Action Plan
ONR	Office of Naval Research (USA)
ONRASIA	U.S. Office of Naval Research International Field Office, Asia
OOPC	Ocean Observations Panel for Climate
ORI	Ocean Research Institute (of Tokyo University)
PALACE	Profiling Autonomous LAgrangian Circulation Explorer
PICES	North Pacific Marine Science Organization
POGO	Partnership for Observation of the Global Ocean
POI FEB RAS	Pacific Oceanological Institute, Far Eastern Branch of the Russian Academy of Sciences
QA/QC	Quality Assurance / Quality Control
ROSHYDROMET	Federal Service of Russia for Hydrometeorology and Environmental Monitoring
RRTDB	Regional Real Time Data Base
RTDB	Real Time Data Base
SCOR	Scientific Committee on Oceanic Research (ICSU)

SeaWiFs	Sea-Viewing Wide-Field-of-View Sensor
SOA	State Oceanic Administration (China)
SST	Sea Surface Temperature
TESAC	Temperature, Salinity and Current report from a sea station (WMO Code)
UNDP	United Nations Development Programme
URL	Uniform Resource Locater (Internet)
VOS	Voluntary Observing Ship