Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

IOC-WMO-UNEP Intergovernmental Committee for the Global Ocean Observing System (I-GOOS-VI)

Sixth Session

10 – 14 March 2003
Paris, France

GOOS Report No. 130 **UNESCO**

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ABSTRACT

The Intergovernmental Committee for GOOS met in Paris from 10-14 March, 2003. It reviewed the relation between GOOS and the WSSD. It commented on the review report on the structure, mandates and *modus operandi* of GOOS. It considered the relation of GOOS to UNCLOS. And it reviewed the state of GOOS development at the national, regional and global levels. It agreed that the regional forum concept had worked well and should be continued with a next meeting in Fiji in 2004. It agreed that the new I-GOOS Board had worked effectively as a mechanism for oversight of inter-sessional activity, and approved the Terms of Reference and Membership of the Board. It made a number of recommendations to improve the functioning and resourcing of GOOS, asking the IOC Assembly to urge Member States in particular (among other things): (i) to implement fully the initial global ocean climate observing system; (ii) to upgrade GLOSS stations and exchange GLOSS data; (iii) to bring meteorological and ocean agencies together at the national level to make JCOMM effective in support of GOOS; (iv) to contribute to the funding of the Argo Information Centre; (v) to provide resources for implementing PIRATA and WIOMAP; (vi) to assist the development of GOOS Regional Alliances; (vii) to ensure the effective functioning and future development of NEAR-GOOS; (viii) to endorse the GOOS Regional Policy; (ix) to report their national GOOS activities to the GOOS Project Office (GPO); (x) to resource the Ocean Information Technology project; and (xi) to provide university courses in data and information management. It also urged the Executive Secretary of the IOC (a) to commit resources for a JCOMM support post; (b) to enhance extra-budgetary funding for GOOS; (c) to seek virtual secondments to support the GPO's efforts at international coordination; (d) to ensure continuity in the post of Director of the GPO; and (e) to use much of the new IOC capacity building post to aid the GOOS capacity building programme. The Committee also endorsed the main thrusts of the GOOS Capacity Building Action Plan. Mme Silvana Vallerga (Italy) was re-elected chairperson, Mr. Rodrigo Nuñez (Chile) was re-elected as a vice chair, and Mr. Guillermo Garcia (Cuba) was elected second vice chair.

Translated into French, Spanish and Russian.
For reasons of budgetary constraints, Annexes remain unstranslated.

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ANNEXES

1. OPENING

1 Mme S. Vallerga, Chairperson of I-GOOS, called the session to order at 0930 on Monday, 10 March 2003. She welcomed representatives of Member States and GOOS Regional Alliances and other attendees. She then called upon the representatives of the sponsoring organizations to speak briefly on behalf of their organizations.

2 Mr. Patricio Bernal welcomed participants to the IOC and to UNESCO, highlighting the importance of this meeting in determining the future of GOOS. GOOS is not a system for research, but a system to serve humanity. A clear vision is required of the management of GOOS and of the duties and functions of I-GOOS. He noted that with the help of I-GOOS and other GOOS bodies the IOC had been very successful in moving this concept ahead. IOC had promoted the concept, raised awareness of the need, and capitalized on existing subsystems to create a whole that was greater than the sum of its parts. The initial focus had been on climate change, since that was what the scientific community was best set up to do at the time. More emphasis was now being placed on the more complex questions of the coastal ecosystem, dealing with the relatively less developed tools of chemistry and biology. Our initial success was high because the science was well developed and the technology was right. That is one reason why GODAE and Argo have been so successful as pilot projects. Chemical and biological science and technologies for the oceans are behind physics. But we now have a design plan for coastal seas and will soon have an implementation plan. In addition we have several regional GOOS bodies that are implementing GOOS in coastal seas. So there is some progress.

3 Mr. Bernal noted that a coastal GOOS offers the opportunity for all IOC Member States to be engaged and to have some ownership of GOOS. I-GOOS recognizes the risks of not involving all Member States in GOOS.

4 GLOSS is an integral component of both the open ocean and coastal modules of GOOS. It currently has gaps in performance and delivery. Efforts should be made to upgrade it to automatic status to ensure continued performance to a high standard.

5 IOC is promoting GOOS development in several different ways, not least by bringing Member States together to agree on a data policy for the oceans. Member States have to do their bit by building appropriate national institutions for operational oceanography.

6 GOOS will be funded primarily by governments as a public service to remove uncertainties in our understanding of ocean processes, for example those taking place in climate change. But, as we have implemented GOOS we have enabled operational oceanography, which has grown to the point of having a private industry providing services to various industrial sectors. The public service platform is underpinning private sector applications, just as it does in meteorology. I-GOOS needs to consider how to better develop this linkage, which is important because GOOS will not grow through scientific justification alone.

7 Mr. Bernal drew the attention of the meeting to the following statement from the IOC biennial report for 2000-2001:

"The long term challenge for the IOC is to define a global framework in which the development of GOOS as a single, permanent, global, public-oriented service can be achieved, with the active contribution of different sectors of the society, including the private sector. This requires demonstration of the economic benefits of a common shared strategy between the public and private sector, the identification of the public and private services that can be derived and/or shared through a common observing platform and the appropriate segmentation of public and private products and users. Achieving this new vision will require the development, negotiation and adoption of international norms and agreements, especially in the area of data and information exchange and sharing."

8 The representative of WMO, Mr. E. Sarukhanian, stressed the importance of GOOS to meeting the goals of WMO, and the significance of JCOMM as a mechanism for implementing GOOS.

9 The representative of UNEP, Mr. Luc St Pierre, noted the continuing interest of UNEP in GOOS and its co-sponsorship of COOP, as well as the local arrangements being made by individual GRAs and the relevant UNEP Regional Seas Programme (RSP) offices. He drew attention to the present scope of the RSPs, and of the role of GOOS as a tool for implementing many RSP requirements.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

10 The Committee adopted the agenda for the session, on the basis of the Provisional Agenda (Annex I), with the modification that session 5 would take place before session 4 and that session 12.2 would be taken immediately after session 9.4.1.

2.2 DESIGNATION OF A RAPPORTEUR

11 Ms. Janice Trotte was designated Rapporteur for the session, under IOC Rule of Procedure No. 25 (3).

2.3 CONDUCT OF THE SESSION

12 The Committee agreed on the working hours for the session, and established one working group (chaired by Mr. Mario Ruivo), to deal with feedback on the 2002 Review of GOOS, another (chaired by Mr. Ariel Gonzalez) to deal with cooperation between ABE-LOS/IOC and GOOS, and a third (chaired by Mr. Rodrigo Nunez) to deal with the work programme and budget. A consultative group chaired by Ms. Janice Trotte was formed to solicit nominations for the elections.

13 The Director of the GOOS Project Office (GPO), Mr. Colin Summerhayes, introduced the documents for the session (Annex II), noting that the following documents were not made available: 14, 16, 23, 44 and 45. Document 19 (PIRATA) was tabled during the meeting along with a new document (53) as the executive summary of the 6th session of the GSC (which had met in Cape Town on 26-28 February 2003). He circulated the Provisional List of Participants (Annex III).

3. REPORT OF THE CHAIRPERSON

14 Mme Silvana Vallerga, I-GOOS Chair, provided a summary of activities undertaken since I-GOOS-V, and noted that the task of I-GOOS is to serve Member States in the implementation of GOOS. She underlined the four main goals before the committee: (i) transferring of science and technology related to GOOS from the research mode into operational mode; (ii) learning from the activity of the regions, and ensuring the coherence between regional activities and global planning; (iii) ensuring that all Member States co-operate in and benefit from the development of GOOS, by capacity building activities involving the transfer of expertise and enabling technologies, (iv) promoting timely observations in the Exclusive Economic Zones allowed by the new technologies available, with the assistance of ABE-LOS/IOC. While (i) is seen to be provided by the scientific and technological advice of the GSC, (ii) to (iv) depend on I-GOOS initiatives, some of them already underway.

15 An I-GOOS Board was called for at the 5th session of I-GOOS in June 2001 to improve efficiency. The Terms of Reference (ToR) and Membership of the Board are given in the report of the first meeting of the I-GOOS Board. The I-GOOS Board has established working groups on EEZ, WSSD, resources, structure, and regional policy and addressed translation and publication of the COOP strategy plan to the widest community possible.

16 Mme Vallerga reminded the Committee that I-GOOS-V had called for a biennial Regional GOOS Forum to be held in years between I-GOOS meetings, with the object of bringing the regional groups together to explore common issues, and to learn from each other about possible best practices in the implementation of GOOS at the regional level. The First Regional GOOS Forum was held in Athens, on December 2 and 6, 2002, on either side of the 3rd EuroGOOS Conference on Operational Oceanography. The venue was chosen to enable representatives to learn at first hand and in a short space of time about operational oceanographic developments in Europe. Participants comprised the chairpersons and technical secretaries of eleven regional GOOS alliances and the heads of the GOOS field offices in Australia and Brazil. Results of the first GOOS Regional Forum were: (i) observing needs and assets in the established GRAs were presented; (ii) the representatives had called for cooperation among GRAs; and (iii) the representatives had agreed to collaborate on joint projects. The Forum agreed to develop a capacity building and cooperation proposal – GOOS Regional Alliances Network Development (GRAND) to be submitted to the EU FP6 programme in April 2003. The objectives of GRAND will be to identify priorities and needs, build capacities and harmonize activities developed by participating countries.

A separate report on the Forum is provided in section 10.1. SOPAC has kindly offered to host the next GOOS Regional Forum in Fiji, in 2004.

17 As regards I-GOOS' activities for 2003-2004, Mme Vallerga emphasized the need to enhance the GOOS Regional Alliances (GRAs) that are ultimately regarded as key building blocks for the global coverage of GOOS.

18 Mme Vallerga informed the meeting that I-GOOS and it's *ad hoc* working group of Experts on GOOS-UNCLOS, had commissioned Mr. Peter Ryder to produce a briefing and discussion document on marine scientific research and operational oceanography in the context of the UN Convention on the Law of the Sea. This document is further discussed under agenda item 7.

19 The Committee noted that good progress was being made and that the creation of the I-GOOS Board and Regional Forum were contributing to make I-GOOS more effective.

20 The Committee approved the ToRs of the I-GOOS Board (established by I-GOOS-V – GOOS Report No. 110) as contained in Resolution I-GOOS-VI.1 in Annex IV of this Report.

4. GOOS AND THE WSSD

21 The Chairperson reported that a Rio + 10 *ad hoc* Working Group had been called for by I-GOOS-V to consider how to convey the message about GOOS to the World Summit on Sustainable Development (WSSD) (e.g. *via* the UN agencies, *via* the G8, and *via* individual Member States). The Chair noted that the Group had met and produced a statement that was passed to the Executive Secretary IOC and that had helped the IOC to make a strong statement to WSSD about the importance of GOOS for sustainable development. The Director of the GOOS Project Office noted that IOC had been involved in several different ways, along with the IGOS Partners, in taking the message about GOOS to the WSSD. As a consequence the Implementation Plan produced by the WSSD contained many statements regarding the importance of making routine observations of coastal seas in support of sustainable development. These included several on the need to enable developing countries to get access to and training in the use of remotely sensed data from satellites.

22 In discussion some Member States indicated the ways in which they had worked with WSSD to influence the development of the Implementation Plan. It was agreed that the requirements of the WSSD Implementation Plan strengthened the mandate for GOOS, especially for observations in coastal seas. Member States agreed that it was important to assist developing countries to gain access to and training in the use of remotely sensed data from satellites. The Implementation Plan calls for a new mechanism to provide assessments of the marine environment, and GOOS could provide key measurements required for such assessments.

23 UNEP indicated its priorities following WSSD, as confirmed by the 22nd General Council of UNEP, as being: (i) land-based sources of pollution from municipal waste water, and agricultural non-point sources of pollution; (ii) pollution from ships; (iii) impacts of urbanization and coastal development on marine and coastal ecosystems; (iv) conservation and management of marine and coastal ecosystems including protected areas; and (v) monitoring, reporting and assessment for the marine environment.

24 SOPAC noted that it was involved in promoting the Pacific Ocean Forum, which would make recommendations on the follow up to the WSSD during a meeting in late 2003 to early 2004, and requested the assistance of I-GOOS in drawing the need for GOOS to the attention of Pacific Member States. It was noted that if the Forum took place in 2004 it could perhaps be held in conjunction with the 2nd Regional GOOS Forum, which is expected to be in the Pacific in 2004.

5. THE REVIEW OF GOOS STRUCTURE, MANDATES AND *MODUS OPERANDI*

25 Mr. Paul Mason, Chairman of the GOOS Review Group, called for by Resolution IOC-XXI.7 of the 21st IOC Assembly (June-July, 2001), summarized the Group's report prepared for the 22nd Assembly (June-July 2003). He explained the background to the review and the process used by the Group to solicit and analyze the views of the community. He observed that the diagram used in the questionnaire seemed to have generated some confusion about the organization of GOOS, and reported on the wide diversity of perceptions expressed on what GOOS was.

26 The Group considered that the mandate for GOOS is satisfactory and should not be changed.

27 After considering several different structural models, the Group had decided that there was some benefit in keeping much the present structure, with some streamlining and with changed terms of reference to make it clear what the roles are of the three complementary bodies: I-GOOS, GSC and JCOMM. He also noted that the Group felt the relation of IODE to GOOS should be close (which reflects the current interaction).

28 Mr. Mason spelled out for the Member States the main recommendations of the report, noting particularly:

(i) funding for GOOS is likely to come mainly from Governments;
(ii) contributions made by the research community should be recognized, encouraged and sustained;
(iii) just a few countries have established national coordination and representation, making I-GOOS work more difficult to accomplish; such coordination and representation is vital for long term implementation success.

29 The Committee thanked Mr. Mason and his group for providing an excellent, thorough and comprehensive report, which would greatly assist thinking about the way forward for the development of GOOS. Many delegations intervened to commend the Report. There was general agreement among Member States on the need for a stronger management structure and that streamlining of GOOS was necessary, so as to restore the dimension of I-GOOS as a governing body. The Member States also agreed that GOOS needed to focus more on the coastal seas in future, and many wanted to see more emphasis on marine pollution and indicators of change. It was suggested that some of the confusion about ownership of GOOS might be avoided by changing the 'S' of the GSC from Steering to 'Scientific'.

30 Some delegations expressed concern about: (i) the conclusions reached by the Review Group, particularly in relation to the reconciliation of divergent views drawn from the questionnaire, and (ii) the structure diagrams shown.

31 The Sessional Working Group on the 2002 Review of GOOS was asked to consider what feedback needed to be provided by I-GOOS both to the review group and to the IOC Assembly, and was asked to give particular consideration to the role of GRAs. Following the suggestions of the Sessional Working Group on the 2002 GOOS Review (comprising Australia, Canada, Chile, France, Germany, Portugal (Chair), Spain, UK, and USA), the Committee made the following decisions and observations:

32 While the Committee appreciated the efforts of the Review Group to strengthen the position of I-GOOS as the lead body for GOOS, with responsibilities for formulating policy and mobilizing resources, the Committee felt that the Review Group had not gone far enough in its recommendations. The Committee noted that the Review Group had called [in revised ToR (iv)] for I-GOOS to encourage and foster regional cooperation including the development of GRAs, but felt that the Review Group had failed in its draft report to identify (i) the critical importance of the GRAs in the implementation of GOOS at the regional level, and (ii) the need for I-GOOS to work with the GRAs on the process of regional development. GOOS Regional Alliances are proving to be a primary mechanism for the implementation of GOOS.

33 The Committee considered that the policy and management roles of I-GOOS would be strengthened and made more effective by its being required to harness the energy of the GRAs in GOOS. One aspect of this role would be, in accordance with the proposed GOOS Regional Policy, for I-GOOS to take on the responsibility of approving GRAs as integral components of GOOS. This could be formalized through the adoption of a protocol or other appropriate instrument.

34 The Regional GOOS Forum provides an additional means through which I-GOOS can encourage the development of GOOS. In due course it may prove appropriate for the Forum to evolve into a more advanced mechanism, such as a federation or network of GRAs, to strengthen the interactions between and the collective ability of the GRAs to contribute the development of the system. The Committee agreed to consider over time how it might explore the concept of a federation of GRAs or a network of GRAs, using the Regional GOOS Forum as a starting point [Refer to action 11 of Annex V].

35 The Committee recognized that the Review had nevertheless gone some way to providing a simpler and better rationalized view of the structure than that which was originally depicted: (i) by eliminating some of the previous structural elements – notably the Sponsors Forum and the GOOS Executive; (ii) by making clear the role

of the GSC in reporting to and advising I-GOOS on scientific and technical aspects and related strategies, and (iii) by having the GRAs participating in and providing reports to I-GOOS. The Committee accepted that the remaining bodies within the structure had all been created to meet specific needs that still needed to be satisfied.

36 The Committee appreciated the intention of the Review Group to underscore the importance of JCOMM as a mechanism for implementing especially the physical components of GOOS. However, as well as recognizing the need for development of JCOMM, the Committee also recognized the need for more emphasis to be placed in future on the development of the coastal module of GOOS, including pollution and living resources. Management of the coastal module might in future require the creation of some mechanism parallel to JCOMM and both linked with I-GOOS and co-sponsored by UNEP and FAO as partners with IOC. This option should be kept open for the future, and reported by I-GOOS to the Assembly at an appropriate time.

37 The Committee noted the several recommendations that the Review Group would be making to the IOC Assembly, and accepted that these would form a starting point for guiding the further development of GOOS. The Committee chose to make specific comments on just a few of these recommendations.

38 The Committee did not accept that its business would be improved by holding I-GOOS meetings at intervals of 4 years with inter-sessional work being carried out by a Management Board. It argued that it is critical at this point in the evolution of GOOS to maintain Member States' enthusiasm for and engagement in GOOS developments, which would not happen if the frequency of I-GOOS meetings was reduced. Therefore it recommended retaining for the moment the present practice of meeting every 2 years. During the discussion on this topic it became clear that the frequency of meetings of the subsidiary bodies of GOOS needed to be considered.

39 The Committee agreed that the Terms of Reference of itself, the GSC and the GPO needed to be re-written, much along the lines suggested by the Review Group, but taking into account the relevant parts of the Report.

40 The Committee noted that the Review Group had not considered in detail the role and Terms of Reference of the I-GOOS Board.

6. RESOURCES WORKING GROUP

41 The I-GOOS Chair noted that I-GOOS-V had called for the formation of a Resources Working Group. However, subsequently, JCOMM had formed a Task Team on Resources (TTR), which had been asked to take on board the requirements of GOOS (especially in terms of capacity building). The Committee felt that despite the existence of the joint JCOMM-GOOS Task Team, the I-GOOS Resources Working Group was still needed because it addressed topics not touched on by the JCOMM-TTR – namely analysis of benefits and communication about them to Member States. The Committee agreed to continue with the creation of the Resources Working Group proposed by I-GOOS-V, with Terms of Reference as given in the report of the first meeting of the I-GOOS Board. Mr. Trevor Guymer (UK) agreed to chair the Working Group.

7. UNCLOS, I-GOOS AND ADVICE TO ABE-LOS

42 The I-GOOS Chair reminded the Committee that I-GOOS-V had suggested that one of the ToRs for the Board might be to "Develop and clarify the legal framework of GOOS, where necessary". To reflect this need, the Chairperson reported that she had taken the initiative to create a small *ad hoc* Working Group of Experts on GOOS-UNCLOS (United Nations Convention on the Law of the Sea). She noted that the deliberations of this small *ad hoc* Group of Experts were intended to be complementary to the consideration of the implications of UNCLOS for the work of the Intergovernmental Oceanographic Commission (IOC) by the IOC's Advisory Body of Experts on the Law of the Sea (ABE-LOS), and should be carried forward in full consultation with that group.

43 The past I-GOOS Chair, and Member of the current I-GOOS Board, Angus McEwan, reported briefly on the discussions concerning I-GOOS and ABE-LOS/IOC in the context of UNCLOS, which took place during the 35th session of the IOC Executive Council (4-14 June 2002). During the Committee's discussion on this topic it was made clear that the procedure for I-GOOS to follow to bring matters to the attention of ABE-LOS was through a request to the IOC Executive Secretary or the governing bodies. A sessional working group was

convened under the chairmanship of Mr. Ariel Gonzales (Argentina) to consider what questions I-GOOS should pass to ABE-LOS through this procedure.

44 The I-GOOS Chair introduced Mr. Peter Ryder, Consultant, to report on the work he had carried out at the request of the I-GOOS Chair, and in response to the recommendations of the *ad hoc* working group, to evaluate the scientific and technical requirements of GOOS in relation to UNCLOS.

45 The Committee congratulated Mr. Ryder for his interesting and comprehensive work. The Committee appreciated the stress given in the report on new technologies for operation and on capacity building. The report will provide Member States with a broad review of new tools and their application in marine observations in the EEZ. Some delegations nevertheless noted that some considerations regarding legal questions, and in particular some attempts to "interpret" UNCLOS for scientists were not appropriate in this context. It reaffirmed that it should ask ABE-LOS to take the relevant legal aspects into consideration following the normal procedure among IOC subsidiary bodies that is through an IOC governing body. The Committee therefore decided on the following course of actions: Action (i): I-GOOS invites its Chairperson to convey to the 3rd meeting of ABE-LOS/IOC the interests of the Committee regarding the collection and management of oceanographic data in EEZs, in the context of the report that the Chairman of ABE-LOS/IOC will provide on the activities of the Group since its last session; Action (ii): I-GOOS recommends to the IOC Assembly at its 22nd session, that ABE-LOS/IOC provides advice on the legal framework applicable to the collection and management of oceanographic data in EEZs. To this regard, I-GOOS offers advice on the technical and scientific context.

8. STATUS OF GOOS PLANNING

8.1 THE GOOS STEERING COMMITTEE

46 On behalf of Mr. Jim Baker, Mr. Tom Malone introduced this item referring to the draft Executive Summary of the GSC-VI meeting. The actions recommended by the 6th session of the GSC are detailed in Annex V (extracted from the draft of the report of GSC-VI, which is GOOS Report No. 129).

47 There had been several key developments in the 2002–2003 period, including (i) the activation of JCOMM; (ii) the 1st Indian Ocean GOOS Conference; (iii) the 3rd EuroGOOS Conference on Operational Oceanography; (iv) the 1st Regional GOOS Forum & Proposal for GRA Network Development (GRAND); (v) the 1st GODAE Conference; (vi) a continual increase in the number of Argo floats deployed; (vii) completion of the Integrated Design Plan for the Coastal Module of GOOS completed; (viii) emphasis by the WSSD on the need for GOOS.

48 Regarding implementation the GSC recommended JCOMM should: (i) engage GOOS Regional Alliances and the smaller coastal states in the JCOMM process; (ii) establish routine procedures for monitoring data streams from national and GRA contributions to GOOS; (iii) determine why so much data are not being archived; (iv) develop procedures for coordinating requirements for observations with implementation mechanisms; and (v) help to ensure that the GPO has adequate resources to complete a rapidly growing JCOMM work load.

49 The GSC recommended that to improve implementation, I-GOOS and the Member States should: (i) take note of the problem of under sampling, and work to increase the number of observing platforms in the coastal area and in the open ocean, repeat SOOP XBT lines, geocentrically located tide gauges, ocean time series stations, Argo floats, tropical moorings, and repeat hydrography/carbon surveys; (ii) participate fully in data archeology; (iii) support GODAE; (iv) promote implementation of Pilot Projects by nations and GRAs; and (v) ensure adequate resources are allocated to the GPO to complete a rapidly increasing number of tasks.

50 To the space agencies, the GSC recommended the following actions to enhance GOOS implementation: (i) ensure continuation of climate quality altimetry, scatterometry, and ocean color missions; (ii) stress the importance of Jason-2 for the success of GOOS; (iii) ensure adequate linkage between the development of remote sensing capabilities and remote sensing requirements recommended by OOPC and COOP; and (iv) carry out a rolling review of the Ocean Theme.

51 Regarding Data and Information Management the GSC recommended (i) placing a high priority on improving data management and communications as the means to develop an integrated system; (ii) working with JCOMM to initiate planning for how the requirements of coastal nations can best be included in the remit of

JCOMM; (iii) organizing a second review of GOSIC; (iv) continuing to implement the GOOS Data and Information Management Plan; and (v) proceeding with the Ocean Information Technology Pilot Project.

52 The GSC considered that the GRAs provide an important framework for achieving the goals of GOOS.

53 The GSC stressed that I-GOOS should make clear to the IOC Assembly the need to ensure continuity in GPO leadership. The GSC also identified the need to formulate a Development Plan for fund raising.

54 On Capacity Building, the GSC recommended a plan for combining the GOOS & JCOMM CB Panels, and have the Chair of the combined CB Panel report on status, progress & plans to I-GOOS and participate in the Regional GOOS Forum.

55 Under Outreach & Communications, the GSC agreed to formulate a communications strategy in collaboration with JCOMM, and to revise/update GOOS 1998 (to GOOS 2004).

56 On Strategic Planning, the GSC agreed to begin to revise/update the Strategic Plan based on the GOOS Review, on new developments (e.g., JCOMM), and on the recommendations of GOOS Advisory Panels & related Bodies.

57 Finally, regarding refinements to the GOOS Structure suggested by the 2002 Review of GOOS, the GSC felt among other things that (i) the development of National GOOS Programmes and GRAs is critical to the implementation of GOOS; (ii) the effectiveness of the I-GOOS and the IOC Assembly in support of the implementation of GOOS should be improved.

58 The Committee congratulated Tom Malone on his succinct and comprehensive presentation, and the GSC on having done a very effective job of assisting the development and implementation of GOOS in the inter-sessional period. The Committee took note of the extensive list of actions identified by the GSC as necessary for the continued rapid development of GOOS and documented in Annex V. The Committee noted that some of the actions were for scientific and technical advisory bodies to the GSC (COOP and the OOPC), others were for the consideration of the JCOMM Management Committee, and yet others were for related scientific and technical bodies (such as CEOS or the IGOS Partners), and endorsed these actions as necessary for the continued scientific and technical development and implementation of GOOS.

59 The Committee took note of the fact that some of the actions proposed by GSC (in Annex V) were for the consideration of I-GOOS. Those actions, in addition to other relevant actions from Annex V, are considered under the appropriate headings in the text of this report. Furthermore the Committee decided on the following actions.

60 The Committee agreed to consider asking Member States to report on what they are doing to assess the state of their ocean ecosystems as a contribution of GOOS to the WSSD Implementation Plan [Refer to action 3 of Annex V].

61 The Committee agreed to encourage GRAs to develop pilot projects at the regional level to demonstrate the usefulness of the ecosystem-based approach to fisheries and environmental management [Refer to action 10 of Annex V].

62 The Committee recommended that the I-GOOS Board be represented on the small intersessional group to draft a Development Plan for Fund Raising and to report back to GSC-VII [Refer to action 36 of Annex V].

63 The Committee noted the formation of an inter-sessional Working Group on Strategy, and requested that the I-GOOS Board be involved in this activity, noting the responsibility of Member States in developing the strategy for GOOS. [Refer to action 44 of Annex V].

64 Colin Summerhayes then reported on the mechanism used to select recent new candidates for the four vacant positions on the GSC. The procedure began with a Circular Letter to Member States as well as inquiries to sponsors and bodies like SCOR and JCOMM, indicating the need for experts in (i) meteorological forecasting; (ii) ocean forecasting; (iii) carbon chemistry; and (iv) ocean biology/pollution. Fifty-eight names had been received and processed in relation to the four skills areas, bearing in mind geographic and gender balance, and the requirement for managerial and operational experience. A short list of 15 names formed the basis for the eventual

selection of four candidates by the Chairman of the IOC. At present there was one vacancy on the GSC, which was expected to be filled from among the previously submitted names of potential candidates.

65 The Committee noted and endorsed the procedure, noting in addition the observation from Paul Mason that the Review Group was satisfied that the balance of operational and academic expertise on the GSC was appropriate to the task.

8.2 THE OPEN OCEAN: OOPC

66 Mr. Neville Smith, ex-Chair of the GCOS/GOOS/WCRP Ocean Observations Panel for Climate (OOPC), reported on recent activities of the Panel, standing in for Mr. Ed Harrison, OOPC's current Chair.

67 Mr. Smith indicated that OOPC is the primary scientific body for providing advice on requirements for sustained ocean data for climate and related physical ocean systems. Thus it provides the climate component of GOOS, which is the ocean component of GCOS. In research its principal WCRP partner is CLIVAR. With new activity in ocean carbon, new partnerships are developing with the international carbon bodies (e.g., the IGBP – WCRP - IHDP Global Carbon Project, or GCP). JCOMM, and particularly its Observations Coordination Group, is an important implementation coordination partner. An updated web-site has been produced at: http://ioc.unesco.org/oopc/

68 With respect to CLIVAR, it was reported that the Working Group on Air-Sea Fluxes had ended, and no successor body was in prospect. Efforts to document the quality of operational air-sea fluxes and to recommend both observational and data assimilation steps to improve them remain needed. The creation of the CLIVAR Basin Panels has changed the requirements for implementation oversight. The OOPC will continue to provide scientific guidance for sustained observations. OOPC and CLIVAR will continue to foster the development of regional research and sustained ocean observing activities. (e.g., IOGOOS and South Atlantic).

69 There are emerging areas of strong interaction between the OOPC and COOP, in the coastal zone and in the open ocean (physics, biology), and between GODAE and COOP.

70 OOPC agreed that it is timely to develop Observing System Evaluation/Monitoring frameworks in order to provide an objective basis for evaluating the present contributions, and to provide a framework for evolving the system and introducing new technologies. The OOPC is continuing to lead the development of the ocean variable index for the 2nd GCOS Adequacy Report to the UNFCCC, and will coordinate participation of WCRP and IPCC ocean experts in preparation of the ocean component of that Report.

71 The GCP is an international initiative to develop research strategies for the integrated global carbon system. The OOPC believes an appropriate approach for carbon measurements is to treat them and the GCP as a "Pilot Project" activity, and that it is timely to begin implementation of routine VOS observations for pCO_2. OOPC will continue to monitor the progress of the ocean carbon coordination project and prepare a plan for a small pilot network of sustained observations of carbon and biogeochemistry from suitable elements of the research-based carbon observing system.

72 Inter-sessional activities in which OOPC has been involved includes the IOGOOS Mauritius Conference, South Atlantic Workshop, PAOOP Workshop in Fiji, UNFCCC/GCOS Adequacy Report, Data and Information Management and the Carbon Cycle project.

73 Development of the ocean climate observing system requires full implementation of the surface and sub-surface networks, and the corresponding data system. Strong links need to be maintained with the research community although a current problem is the absence of a large-scale ocean research project. Even so, OOPC has been successful in directing an integrated approach.

74 Mr. Smith reported on the progress of various elements of the observing system, indicating percent completion of the following subsystems: GPS/DORIS (47%), Tropical Moored Buoy Network (80%), XBT (45%), ocean reference stations (19%), CLIVAR CO_2 (good progress), VOS/sfc drifters (45%), and work needed in the South Atlantic and Indian Ocean. In the satellite area, it will be necessary to revise the Ocean Theme and to sustain present measurements at the climate standards level.

75 Following Mr. Smith's excellent presentation, WMO commented that the Commission for Basic Systems (CBS) is looking forward to work closely with GOOS, in the context of its work on observational data

requirements and the re-design of the Global Observing System of the World Weather Watch, to incorporate GOOS data requirements into the consolidated WMO/CEOS observational requirements data base.

76 The Committee agreed to bring to the attention of Member States, through the IOC Assembly, the need for the following actions to implement fully the initial global ocean climate observing system [Refer to action 12 of Annex V]:

(i) to increase the number of surface drifting buoys to 1250, of repeat SOOP XBT lines to 41, of geocentrically located tide gauges to 69, of ocean reference time series stations to 29, of Argo profiling floats to 3000, of VOSClim ships to at least 200, of tropical surface moorings to 119 and to carrying out the agreed repeat hydrography and carbon content and surface carbon flux survey projects, which are the key *in situ* observing elements of the agreed initial global ocean climate observing system.

(ii) to participate fully in ocean data archeology efforts, in free and open exchange of contemporary data, and in support of the development and use of modern data communication, access and serving technology, which comprise the data system component of the agreed initial global ocean climate observing system.

(iii) to support the Global Ocean Data Assimilation Experiment and other ocean climate analysis activities, which comprise the ocean climate product component of the agreed initial global ocean climate observing system.

(iv) to implement the agreed ocean reference sites within the framework of the Global Climate Observing System (GCOS) project, recognizing that they are a key link between the initial global ocean climate observing system and the development of sustained observations in support of the work of the biogeochemical and ecosystem communities.

77 The Committee indicated that presentations, such as Mr. Smith's, were invaluable to I-GOOS and should be encouraged in the future. It noted that technology needs continual development and is linked to available resources, which the Assembly should help to identify.

78 The Committee noted and endorsed progress, and commended OOPC on its efforts to refine and expand the system.

8.3 THE COASTAL OCEAN: COOP

79 Mr. Tom Malone, co-chair of the Coastal Ocean Observations Panel (COOP), reported on the activities of this panel, which was established in 2000 by a merger of three existing GOOS design panels – the Health of the Ocean (HOTO,dealing mainly with marine pollution), the Living Marine Resources (LMR, dealing with sustainable marine resources and biodiversity), and the Coastal panel (C-GOOS,dealing with safe and efficient marine transportation, predicting and mitigating coastal hazards, and preserving and renewing healthy marine ecosystems). At the end of 2000 the GOOS Steering Committee (GSC) had decided that the three plans should be integrated into one plan for a coastal ocean observing system that provides the data and knowledge required to:

- improve the safety and efficiency of marine operations;
- more effectively control and mitigate the effects of natural hazards;
- improve the capacity to detect and predict the effects of global change on coastal ecosystems;
- reduce public health risks;
- more effectively protect and restore healthy ecosystems; and
- restore and sustain living marine resources.

80 COOP has held four sessions in: (i) San Jose, Costa Rica, November, 2000; (ii) Trieste, Italy (June 2001); (iii) Hanoi, Vietnam (January 2002); and (iv) Cape Town, South Africa (September 2002). At each COOP session local and regional stakeholders were invited to attend to provide input to the planning on local and regional observing activities, user product needs and capacity building needs.

81 Mr. Malone provided an overview of The Integrated Strategic Design Plan for the Coastal Ocean Observations Module of the Global Ocean Observing System. This plan has been completed following review by over 20 external reviewers from more than 10 countries worldwide. Based on these reviews, which were very positive, the document was re-drafted and discussed in detail at the COOP-IV session in September 2002. A

revised and final draft was then made available for the 6th session of the GSC (26-28 February 2003) and for the 6th session of I-GOOS. The GSC considered that the document was ready for publication.

82 The intent has been for the plan to integrate as far as possible the core physical, biological and chemical measurements required for mapping and forecasting the behaviour of the coastal ocean. To ensure that this intent is met, the Panel comprises biologists, chemists and physicists, and its co-chairs are experts in biology and chemistry. The Plan offers a suite of core measurements to underpin safety issues, the biological measurements required to address ecosystem and living resource issues, and the chemical measurements to address marine pollution and environmental and human health risks. It is expected that following publication of the Design Plan in 2003, an Implementation Plan, will be completed in 2004.

83 The Committee noted the progress with the design plans for the coastal module of GOOS and thanked Mr. Malone for the clear presentation and extensive work of the panel.

84 Some representatives questioned the design advice to establish the global federation of GOOS Regional Alliances suggested in the draft COOP Design Plan. They did not see the need at this time to endorse the creation of such a federation. The Committee had already agreed in paragraph 34 (agenda item 5) that the Regional Forum provides a useful starting point through which GRAs can work together. It was agreed that the COOP Design Plan would be modified to reflect this decision.

85 The Committee commended the efforts of COOP to come up with an integrated design for a coastal seas observing system involving biological and chemical elements as well as physical ones. I-GOOS recognized the difficulty of designing such a system in a comprehensive way, given that much research was still needed to establish (a) what chemical and biological variables needed to be measured, (b) where they needed to be measured (since different regions would be interested in different variables), and (c) what methods could be used to achieve routine and systematic monitoring of those variables once they were identified and agreed upon. A great deal of research would also be needed to determine the biological and chemical indicators that could and should be used to assess water quality, marine pollution and ecosystem health within the coastal GOOS programme.

86 Portugal suggested that the IOC Assembly give attention to stimulating through its Ocean Science programmes the research needed to put ocean observations of water quality, marine pollution and ecosystem health on a sufficiently firm footing so that they could in future be incorporated into a coastal ocean observing system.

87 The Committee also saw strong grounds for the development of close relationships between I-GOOS and the Regional subsidiary bodies of IOC and appropriate regional organizations including the UNEP Regional Seas Programmes and Action Plans. The regional components of GOOS should also be able to provide the products on pollution and ecosystem health that are required by Member States scientists and other users, usually Public Administrators as a result of governmental commitments derived of conventions and other instruments dealing with marine pollution control and prevention.

9. STATUS OF GOOS IMPLEMENTATION AT THE GLOBAL SCALE

9.1 THE *IN SITU* ELEMENTS OF THE OBSERVING SYSTEM

88 Mr. Etienne Charpentier elaborated on the status of the present global elements of GOOS, focusing on the DBCP and SOOP, which are key components of JCOMM. A large number of data buoys are deployed through the DBCP, with the majority reporting on the GTS. Much of the impetus for the programme, and its excellent management reflect the activities of the DBCP's regional action groups, as well as the activities of national programmes that participate in and provide data to the DBCP. The Ship of Opportunity Programme, which deploys XBTs, has been integrated under the JCOMM Ship Observation Team, along with VOS and ASAP. It has continued to evolve, with a move away from distributed (broadcast) sampling and towards focused, high-density sampling on repeat lines. Argo floats will gradually replace the broadcast sampling, providing more comprehensive global coverage. Declines in XBT deployments in recent years may reflect several factors, particularly the difficulties in maintaining the same rate of XBT deployments in the face of a doubling in XBT cost. Argo and SOOP Programmes are regarded by OOPC as complementary.

89 The Committee expressed its appreciation for the high quality work of JCOMMOPS, and the coordination of these various ocean data collection activities.

90 Mr. Thorkild Aarup elaborated on the GLOSS programme, another element of JCOMM, noting that GLOSS data were reported either in delayed mode or through the fast data stream (within one week). Two thirds of the GLOSS network of around 300 tide gauge stations is currently operational, meaning the data are reported to the PSMSL in the UK. Eighty stations provide data through the fast stream (to the University of Hawaii sea level centre). GLOSS involves not only data collection but also training, visits by experts, and the publication of manuals. There is a need to increase the number of stations supplying fast data, which implies a need to modernize and upgrade many of the GLOSS stations so that they can keep pace with the demand for data to calibrate satellite altimetry data, and to feed information into ocean and climate models in near real time. An analysis of the requirements is being made for a GLOSS Adequacy Report that will be presented to the next IOC Assembly and that will include a plan for upgrades to meet the goals of OOPC and COOP.

91 The Committee agreed to recommend to the IOC Assembly that Member States should (i) upgrade all GLOSS designated stations for real-time data delivery by 2004, and (ii) provide their GLOSS data as required by the GLOSS Implementation Plan approved by the IOC Assembly in 1997.

9.2 JCOMM

92 Mme Savi Narayanan, Co-president of the Joint WMO/IOC Technical Commission on Oceanography and Marine Meteorology (JCOMM), reported on progress made in the development of JCOMM and its significance for the ongoing implementation of GOOS. After describing briefly the JCOMM structure, she especially highlighted (i) progress in coordinating of the GOOS observing elements DBCP, SOOP and GLOSS in support of integrating data requirements expressed by GOOS and other systems; (ii) the support provided by JCOMM in the development of Argo and OOPC; (iii) the efforts underway within JCOMM to develop performance metrics to measure to what extent existing requirements were met; (iv) the high priority given to integrated data management, (v) collaboration with IODE through merging of the JCOMM expert team on data management practices and the IODE Group of Experts on technical aspects of data exchange, as well as by the IODE secretariat providing the secretariat function for the JCOMM data management area; (vi) the establishment, within the Services programme Area, of a new Task Team on Development of Ocean Services; (vii) the work of the JCOMM Capacity Building Coordination Group and its possible merging with the GOOS Capacity Building Panel. Mme. Narayanan concluded by expressing satisfaction that JCOMM was moving forward, and that the major steps for enhanced coordination were taken. She invited the Member States to Halifax, Canada, to attend JCOMM-II and the Scientific Conference scheduled to take place in September 2005.

93 Mme Narayanan noted that, at the initiative of JCOMM, an historical conference was being convened, in Brussels in November 2003, to celebrate the 150th anniversary of the seminal Maritime Conference that took place in Brussels in 1853. That Maritime Conference, convened by Lt. Matthew Fontaine Maury, USN, initiated international cooperation, coordination and standardization in marine meteorological and oceanographic observations and data collection. It led more or less directly to the establishment, 20 years later, of the International Meteorological Organization, the predecessor of WMO, and helped to shape the development of operational meteorology and oceanography over the next 150 years. The planned Brussels 150th celebration conference will both honour the pioneering work of Lt. Maury and also draw lessons from what has happened since 1853 in planning the further development of operational oceanography in the 21st century. The Committee recognized the significance and value of the planned conference, and urged Member States and GRAs to support and participate in it to the extent possible.

94 The Committee expressed satisfaction at the considerable developments that had occurred within JCOMM in a relatively short period of time. It recalled that an issue faced by JCOMM was to improve collaboration at the national level between the oceanographic and meteorological communities. It suggested that the GOOS National Committees or bodies in charge of GOOS might help in this respect, in that they offered a forum where oceanographic organizations were meeting together. The Committee agreed to ask the IOC Assembly to urge Member States to encourage collaboration between meteorological and oceanographic organizations at the national level so as to ensure the effectiveness of JCOMM.

95 The Committee noted that the question of data exchange was critical to the success of JCOMM and that the definition of an adequate data policy was of the utmost importance to the development of operational oceanography. The Chairman of the Intergovernmental Working Group on IOC Oceanographic Data Exchange Policy, Mr. Angus McEwan, reported that a draft Resolution had been prepared for adoption by IOC-XXII, and that its wording had agreement among the members of the Working Group.

96 The Committee considered that JCOMM offered a good mechanism for the development of operational oceanography, especially the ocean climate component, and that a cornerstone in that development laid with the definition and implementation of an integrated, end-to-end, data management system. To reach that objective, it was necessary to establish a unified set of agreed upon standards, in particular for metadata exchange, whereas the present situation was more characterized with the multiplication of such standards - which in fact meant that no standards were internationally agreed upon. The Committee expressed satisfaction to the high priority given by JCOMM, in close association with IODE, to that question and to the steps already taken in that direction.

97 The Committee noted it would not meet again sufficiently ahead of JCOMM-II (Halifax, September 2005) to be able to provide an input to the session. It therefore welcomed the establishment by the GSC of an "inter-sessional Working Group to develop GOOS inputs to JCOMM-II". It requested that the Working Group report and consult with on that topic to the I-GOOS Board.

9.3 SPACE-BASED MEASUREMENTS AND THE IGOS PARTNERS

98 Mr. Eric Lindstrom (NASAUSA), reported on progress made in the contribution to achievement of the goals of GOOS by remote sensing from satellites. The space agencies are working in concert with each other, and with the IOC, WMO and GOOS, to ensure the delivery of measurements specified by the GOOS community. GOOS and the IOC interact with these agencies through the Committee on Earth Observing Satellites (CEOS), the Partnership for an Integrated Global Observing Strategy (IGOS), and the Coordinating Group on Meteorological Satellites (CGMS). The role of the IGOS Partners is specified in the IGOS Oceans Theme. (http://ioc.unesco.org/igospartners/IGOS-Oceans-Final-0101.pdf). The Oceans Theme could be seen as a pathfinder for integration and implementation of observing strategy including the two main challenges: (i) continuity, which concerns the operationality of the systems, and (ii) knowledge, focusing on research and development. The main objectives are to describe gaps and overlaps enabling implementation decisions. Mr. Lindstrom stressed that a key objective of the Ocean Theme is to promote integration of space-based and *in situ* measurements observations. He reminded the meeting that the Ocean Theme originated in 2001, and was due for revision this year. He provided a review of progress with existing Ocean Satellites and their key measured parameters/variables including (i) Ocean Surface Topography, successful with the launch of Jason 1, and plans for Jason 2; (ii) Ocean Vector Winds, with a launch of SeaWinds and a plan for follow-on and a series of ASCAT on METOP, noting the incorporation of scatterometer data in operational forecasting systems, (iii) Ocean Color with SeaWifs extended, a second MODIS in Orbit, and multiple missions planned; integration of data sets is a challenge; (iv) Sea Surface Temperature, with development of improved data sets from research, (v) Salinity, with SMOS and Aquarius, (vi) and Bottom pressure, with GRACE providing the key data set. He noted that the biology and carbon issues are important for the IGOS Partners.

99 Mr. Lindstrom stressed that emphasis will be put on GOOS products and services to energize the transition of key satellite measurements from research to operations, bearing in mind Mr. Bernal's words that "GOOS is not a system for research, but a system to serve humanity". The Ocean Theme will also take into account the advice of JCOMM and the results of GOOS review.

100 In the ensuing discussion, some representatives asked whether the IGOS Partners would maintain websites where Ocean Theme products would be located. Mr. Lindstrom noted that individual agencies would maintain websites containing a variety of products, but the IGOS Ocean Theme team itself is not charged with collecting information on products for dissemination on website of by other means. The goal of the Team is to describe the problems related to observing systems and elaborate what needs to be done to further develop GOOS, so that a wide variety of products can be obtained.

101 The Committee noted the progress in implementing the Ocean Theme and endorsed the IGOS Partners approach to assisting in the design and implementation of GOOS. The Committee requested Member States to provide support for the JASON 2 mission.

9.4 PILOT PROJECTS

9.4.1 GODAE and ARGO

102 Mr. Neville Smith, Chair of the International GODAE Steering Team (IGST), presented an overview of the GODAE Project. Essentially GODAE will use modern assimilations and modelling techniques of global ocean circulation to produce climate and regional models to produce useful products. It is a practical demonstration using real-time ocean data. The "GODAE Commons" concept consists of: assimilated products, data products, infrastructure and a jointly developed knowledge base.

103 Critical data streams for GODAE are: altimetry, the geoid, SST, and surface winds. The key satellites for providing these data are Adeos II, EOS-Aqua and ENVISAT. The countries flying these satellites are to be thanked.

104 The High Resolution SST Project is part of GODAE and will contribute to many of the goals of GOOS.

105 Many countries are contributing to GODAE by setting up projects. Japan: SST, France: MERCATOR, US: HYCOM, UK: FOAM, Australia: Navy modelling. All those listed have websites with products available.

106 Mr. Smith mentioned the PAOOP Workshop, hosted by SOPAC in Fiji during October 2002. Logistics provided by SOPAC were superb and the dialogue between the users and providers resulted in a proposal to setup a Pacific Ocean Information Centre at SOPAC. This workshop should be repeated in other regions over the next few years.

107 In the years 2003 to 2005, products will be delivered in the demonstration phase of GODAE. In 2005, the high-resolution models should come on line.

108 The Committee noted the very significant progress being made, and complimented Mr. Smith on the achievements to date.

109 Mr. Etienne Charpentier presented an update on the Argo programme. Argo is now in its implementation phase. 722 floats were operational at the time of the meeting. Success in the development and implementation of the Argo programme is due to: (i) the science plan developed by the Argo Science Team under CLIVAR and GODAE, and (ii) a clear objective together with an easy to understand rationale and specific sampling requirements. Hence strong scientific consensus could be reached which led to a strong political consensus to support the programme and therefore funding of the programme.

110 Argo is part of the climate observing system and is complementary to other observing systems such as Jason-1 satellite (higher space/time resolution), TAO and PIRATA moorings (air-sea exchanges), XBTs (line mode), high frequency time series measurements. Argo plans to provide global temperature and salinity profiles every 10 days at a resolution of 3°x3° and sub-surface velocities at depths between 1500m and 2000m. The main goals are to (i) observe the ocean's storage, and internal transport of heat and freshwater (T, S, and velocity), (ii) evaluate precipitation minus evaporation variability (S), and (iii) eventually improve seasonal-to-interannual prediction.

111 Scientific analysis is underway regarding subtropical mode waters in the North Western and South Western Pacific Ocean, interannual variability in the tropical Pacific Ocean, local heat budget analysis, and basin-scale data assimilation projects in the Atlantic Ocean. One of the first results concerns dynamic height anomalies due to salinity differences with historical data.

112 A few challenges remain. These include: (i) maintaining a level of funding of about 800 floats per year to reach the target of 3000 operational floats in 2006 and to demonstrate the value of Argo (is the approach, design, cost-effectiveness adequate?), (ii) maintain technical standards, (iii) ensure deployment of an evenly spaced array, and deployments in the Southern Ocean at the required 3°x3° resolution, (iv) establish a high level of international planning and cooperation, including for the deployments by ship or air, (v) broaden the understanding of the Argo value, (vi) ensure long term scientific involvement and stress the high quality of the data, (vii) establish strong cooperation with operational agencies, and (viii) facilitate transfer of technology. Although profiling float technology is well proven, a few technical challenges remain, including (i) better satellite data telecommunication (reducing time spent at the surface, improving vertical resolution), (ii) greater buoyancy control, (iii) improved ruggedness, and (iv) addition of new sensors (stability of salinity was demonstrated).

113 The Fifth Argo Science Team meeting was recently held in Hangzhou, China, 4-6 March 2003. It was reported that the 1,000-float milestone will occur later in 2003 and that completion of the initial 3,000-float array is expected by 2006. Elements of the real-time and delayed-mode data system are already in place. Average time for access of real-time data via GTS is reducing towards the 24-hour target. Real-time data are also available via the Internet from the two Global Argo Data Centres (Coriolis, US-GODAE). Float reliability continues to improve as earlier modes of premature failure have been diagnosed and design changes implemented. New float designs from Japan (NINJA) and China (COPEX) are currently being tested and evaluated. The priority for 2003/04 is to deploy more floats in the Southern Hemisphere (currently approx. 500 in the Northern Hemisphere (NH), and approx. 200 in the Southern Hemisphere (SH). Argo will need approx. 1,000 floats in the NH and 2,000 in the SH. This will be a major challenge to float providing nations. The Argo Director (Mr. John Gould) is now in post to provide strategic direction, and to work closely with the JCOMMOPS Argo Coordinator (Mr. Mathieu Belbéoch). The Director's post is initially funded by the US for one-year, but will require international support in the longer term. Demonstration of benefits from Argo will be critical in securing future sustained funding for Argo. The 1st Argo Science Workshop, which will highlight early scientific results/benefits obtained, is scheduled for 14-16 November 2003 (Tokyo, Japan).

114 A report was also presented on the operations of the Argo Information Centre (AIC), a component of JCOMMOPS, which is funded through voluntary contributions from Canada, France, United Kingdom, and USA. AIC provides general information on Argo (e.g. web site, newsletters), facilitates programme implementation (e.g. day to day coordination and support, monitoring system, web tools), acts as a focal point between Argo actors (float operators, manufacturers, telecommunication providers, data centres) and provides a gateway to the Argo Global Data Acquisition Centres (GDAC). AIC also offers a practical means for implementation of IOC Resolution XX-6 to inform Member States on actual float deployments.

115 The Committee invited the Member States to contribute to the AIC trust fund at IOC in order to ease the contributions from those already making commitments.

116 A number of delegations commented on the excellent work of Argo. While acknowledging the importance and value of Argo, some other delegations expressed concerns about the inadequate fulfillment of the conditions set out in Resolution XX-6 of the IOC Assembly, as regards information on Argo floats that may drift into waters subject to the jurisdiction of a coastal state. Such information was essential, though, to promote Argo as an intergovernmental activity supported by all Member States of IOC. Argentina further expressed the view that if this situation persisted there might be a need to address the IOC Assembly on this matter. The Argo coordinator was aware of only one reported problem in this connection, which was in the Indian Ocean. That had been resolved. SOPAC reported complete satisfaction with the information provided and the visits to the Pacific region to explain the programme. From the Chair it was noted that an improved exchange of information will help to broaden the broadening of support for Argo, as requested by the Argo coordinator, for the benefit of all Member States.

117 It was noted that: (i) individuals or scientists in Member States were not necessarily aware of the name of the National Focal Point (NFP) for Argo in their country, and (ii) changes were not necessarily reflected in the list when NFPs changed positions. Action: In order (i) to facilitate maintenance of the list of NFPs for Argo by Member States, and (ii) to facilitate communication between them regarding the Argo programme, the Committee asked the Argo Information Centre to make the list easily available *via* its web site from the Home Page. Information should also be placed on how to practically submit changes to the list.

9.4.2 PIRATA

118 Mme Janice Trotte gave an overview of progress with the Pilot Research Array in the Tropical Atlantic (PIRATA), a project jointly sponsored by France, Brazil, and the US to provide real-time information on surface and subsurface data for the Tropical Atlantic region. The original array was conceived to have 12 ATLAS buoys located along the equator, which would be serviced by the supporting countries, especially France and Brazil, with ship time. The Project is in a 5-year "consolidation" phase intended to run from 2001 to 2006, and which will allow time for demonstrating the utility of PIRATA data in climate forecasting and applications to operational oceanography. Success during the consolidation phase could lead to consideration of PIRATA as a permanent feature of the global ocean and global climate observing systems.

119 Mme Trotte reported that the 9th Session of the PIRATA Steering Group (PIRATA-9) and the Second Meeting of the PIRATA Resources Board were held in Angra dos Reis, Brazil, from 3-5 February 2003, where the PIRATA Steering Group (SSG) acknowledged the expressed interests of Brazil and South Africa to propose Southwest and Southeast extensions, respectively, to the original backbone. Once the final corresponding proposals are received, they will follow a PIRATA Extension Evaluation Process to assess the justifications for extensions, their costs, and the relevant priorities.

120 Mme Trotte described the logistic problems with the array, including vandalism, local mechanical failures, difficulties in accessing and processing the data in real time, the sparseness of ADCP data, acquiring ship time, and securing long term funding.

121 Mme Trotte noted that the recently created Atlantic Observations Working Group (AOWG) under the auspices of PIRATA will deliver a special report to the participating institutions with regard to the needs for ocean observations in the Tropical and South Atlantic, options for meeting those needs, and associated ship requirements. It is open to all nations to participate. The AOWG will consider long-term ocean monitoring requirements for sustaining the PIRATA enhanced system, deployment and maintenance of other surface and subsurface observational systems planned for sustained climate and ocean observations, and supporting other international programmes for operational oceanography, as appropriate.

122 A set of recommendations was approved during the PIRATA-9 meeting, calling for, among other things:

(i) the consolidation of the required training and transfer of technology between Brazilian and French scientists at NOAA;

(ii) the means through which the PIRATA-enhanced system (including its extensions) could benefit from the the EU Framework Programme 6 (FP-6), where support is available for joint projects between developing nations and EU countries; and

(iii) a Data Analysis Workshop for PIRATA, to be held in Brazil (INPE/CPTEC or IO-USP), in the second half of 2003.

123 Ms. Trotte reported that the South Atlantic Climate Observing System (SACOS) Workshop, supported by CLIVAR, IAI, IOC, ONRIFO, and OOPC, was held immediately after PIRATA-9, with the aims of identifying (i) gaps in our understanding of the climate processes in the south Atlantic, and (ii) efforts needed to understand the role of the South Atlantic in the climate system on the regional scale. PIRATA figures as a key element of any future observing system for the region.

124 The Committee noted and endorsed the intention to make PIRATA operational after 2005, and the proposal for the Rio GOOS Office to work with Member States in the region to develop GOOS in the South Atlantic.

125 One of the delegates expressed interest to follow on an eventual project submission to the EU FP-6, regarding PIRATA. The French Delegation informed that additional financial support will be available for the next 4 years to secure the French contribution to the development of PIRATA. Although the French-serviced buoys have been subject to vandalism, it is worth noting that since the beginning of the year 2003, the part of the original array covered by France is fully operational, with 12 campaigns being held. The French Delegate suggested to the Committee to consider further actions for a dedicated operational vessel in the Atlantic Ocean, since at present, PIRATA surveys with research vessels are extremely costly and compete with other research programmes.

126 The Committee agreed to pass the suggestion of the French delegation to the PIRATA Steering Group for further consideration.

127 The Committee endorsed the establishment of the Atlantic Observations Working Group (AOWG) to will consider long-term ocean monitoring requirements. The Committee recommended that the AOWG pays careful attention to the issue of cost-effective solutions in terms of ship support.

128 The Committee noted and endorsed progress with PIRATA and called on Member States to support it.

9.4.3 WIOMAP and Others

129 Peter Dexter, joint JCOMM Secretariat, reported briefly on the status of the Western Indian Ocean Marine Applications Project (WIOMAP), a major regional cooperative capacity building project of JCOMM. The project, which has as its fundamental objective the enhancement of the capabilities of institutions in the western Indian Ocean region to provide operational marine services in response to identified user requirements, was initiated in mid-1997 with a first planning meeting in Mauritius. The participants in this meeting, representing both meteorological and oceanographic agencies, agreed on the requirements for and objectives of the project, as well as a plan for further development. Subsequently, and following extensive further consultations, a draft project document was prepared and reviewed at a second planning meeting, also in Mauritius in conjunction with the Indian Ocean GOOS Conference, November 2002. Following further refinement, it is hoped that the agreed final project document will be ready for submission to funding agencies, by Mauritius on behalf of all participants, in late 2003.

130 The project is structured in four self-contained but inter-related modules: (i) capacity building; (ii) observing network and data management enhancement; (iii) communications networking; and (iv) establishment of specialized marine applications centres. The JCOMM Task team on Resources will assist in identifying potential funding sources for the project, which is seen as a direct contribution to both Indian Ocean GOOS and GOOS Africa.

131 The Committee endorsed the project as potentially an important contribution to GOOS in the western Indian Ocean region, and urged Member States to assist wherever possible in its implementation, in particular through the contribution of the resources required for this implementation.

10. STATUS OF GOOS IMPLEMENTATION AT THE REGIONAL SCALE

10.1 REPORT OF THE 1st REGIONAL GOOS FORUM

132 The report on the outcomes of the First Regional GOOS Forum (Athens, 2 and 6 December 2002), was given by the I-GOOS Chair under agenda item 3. Under agenda item 10.1 the Committee noted the various collective needs for development that had been expressed by the GRAs (Annex VI), and agreed to draw these to the attention of the IOC Assembly.

133 The Committee agreed that the Regional Forum was a useful development and should be repeated, and charged the I-GOOS Board with the organization of the next meeting in terms of the venue, timing, agenda and priorities, taking into account the kind offer of SOPAC for a meeting in the Pacific region in 2004.

10.2 REGIONAL GOOS DEVELOPMENTS

134 Representatives of regional GOOS bodies and projects reported on the progress in the development of GOOS at regional level. This included presentations from NEAR-GOOS, EuroGOOS, GOOS-AFRICA, MedGOOS, IOCARIBE-GOOS, Pacific Islands GOOS, SEA-GOOS, Black Sea GOOS, Indian Ocean GOOS and US GOOS.

135 Mr. Vyocheslov Lobonov reported on the progress in the development of **NEAR-GOOS**. The main objective was to establish Real-time and delayed Mode Data, bases which are operationally closely linked. Regarding the NEAR-GOOS data flow, data exchange has developed quite well, though improvements are still needed. The Japan Meteorological Agency supplies the Internet service with daily sea surface temperature analysis. Capacity building is a key element of NEAR-GOOS, addressed in a workshop on Data Management being provided in Tokyo. NEAR-GOOS had developed interactions with other programmes in the region, such as the PICES, PAMS/JECSS, and UNEP projects, the GEF/Yellow Sea LME, COOP and other IOC/WESTPAC projects. Achievements of NEAR-GOOS include initial phase development, and an outline strategic plan for the second phase. The constraints to development include lack of strong coordination in some countries; too few experts involved in the Scientific Steering Committee, and funding. The plan is to further improve data exchange, to widen the range of data exchanged and to involve more agencies.

136 The Committee urged the Member States of NEAR-GOOS on the one hand to exchange more data so as to make NEAR-GOOS fully operational to add additional parameters to as to fill important data gaps and to provide the necessary funding.

137 The Director of **EuroGOOS**, Mr. Hans Dahlin, recalled that the recent EuroGOOS Conference in Athens provided extensive information on the status of development of GOOS in Europe. EuroGOOS is an Association of 31 Agencies with national responsibilities in 17 countries.. Many of the EuroGOOS members are Governmental agencies. The main objective of EuroGOOS is to promote operational oceanography at the national, and European levels and to get the needed support. Infrastructure building is based on requirements at global, European, sub-regional, and national levels, financed by national sources, and sustained through binding agreements. The decrease of resources for marine activities at national level in counteracted by the joint co-operation. User's demands comes from many sources including regional Conventions and associations including HELCOM, ICES, International Baltic Sea Commission, and Barcelona Convention. The European infrastructure for ocean monitoring and forecasting is built through an interagency agreements and by joint projects. European projects stimulated by EuroGOOS include MAMA, ARENA, PAPA, EDIOS, and Marine XML, MFSPP. Sub-regional initiatives in the North Sea (NOOS) and in the Baltic (BOOS) are adding value to the EuroGOOS cooperation. In addition there are the Arctic and Atlantic Task teams examining further developments. Present priorities focus on capacity building for European operational oceanography. The science, technology and logistics for a European Centre for Ocean Monitoring and Forecasting (ECOMF) are underpinned in the ongoing European project MERSEA, promoted by EuroGOOS and supported by the European Commission.

138 Mr. Justin Ahanhanzo reported that **GOOS-AFRICA** is focusing on coping with the many hard realities of climate in Africa such as droughts, floods, sea level rise, etc. Much of their time has been spent in drafting a major proposal on a Regional Ocean Observing and Forecasting System for Africa (ROOFS-AFRICA) for consideration for funding through the African process and NEPAD. GOOS-AFRICA has been actively encouraged to relate its funding requests to the regional LMEs, such as that for the Benguela system. The IODE noted that some of the funding needed to build the capabilities of GOOS-AFRICA was being supplied through the ODINAFRICA programme. The Committee noted the progress of GOOS-Africa, and called for continued collaboration between GOOS and IODE in Africa.

139 Mme Silvana Vallerga reported on **MedGOOS**, which is based on a Memorandum of Understanding between 20 national agencies from 17 Member States. She was pleased to announce that INSTM, Tunisia, had just signed the MOU, thus formally joining MedGOOS after cooperating with it since its activities began. Although not all Mediterranean countries have signed the MOU, nevertheless all are participants in the MedGOOS-led MAMA project, that has been successful in winning funds from the EC. MedGOOS has a full time Secretariat, based in Malta to support the development of ocean monitoring and forecasting for the benefit of all Mediterranean countries, through the MAMA members. The EuroGOOS and MedGOOS promoted, and EC-funded Mediterranean Forecasting System Pilot Project (MFSPP) has been providing ocean forecasts for some time for MedGOOS countries, and is now continued by the MFSTEP (Mediterranean Forecasting System Towards Environmental Prediction,. The MEDAR/MEDATLAS project has successfully quality checked and rescued important archived data on the Mediterranean and Black Sea. MedGOOS already has two buoys in the water and through MAMA has begun capacity building, exchange of personnel, planning the initial observing system for the basin, and awareness raising at national and regional level. MAMA has awarded 30 fellowships for 1 month training at selected hosting centers. MedGOOS is also keenly interested in the concept of a European Centre for Ocean Modelling and Forecasting (ECOMF) to be established with the MERSEA Project. MedGOOS is now leading the development of the GOOS Regional Alliances Network Development (GRAND) proposal for cooperation among all GRAs. MedGOOS is currently working, in cooperation with Black Sea GOOS, on the preparation of a large integrated project for establishing the initial monitoring system involving all Mediterranean countries, Black Sea and Caspian Sea countries.

140 Mr. Cesar Toro reported on **IOCARIBE-GOOS**, which has recently established its Steering Committee and will be holding a regional symposium as part of the Oceanology Americas meeting in New Orleans in April 2003. Member States primary interests are in getting information from GOOS that is useful to fisheries, oil production, and coastal users (tourism). Coastal GOOS is thus a priority in the region. Climate needs will be addressed through regional modelling projects. Possible collaboration will occur between IOCARIBE, US State Department, NOAA and UNEP for the Blue Water to White Water regional conference. IOCARIBE-GOOS will also exploit the IODE's development of ODINCARSA in the region, to build up the required data and information management infrastructure. IOCARIBE-GOOS needs to work with the Caribbean Environment Programme (CEP), coordinated by UNEP, to determine what products the RSPs require and what GOOS may be able to deliver that could also be useful.

141 Mr. Alf Simpson reported on **Pacific Islands GOOS (PI-GOOS)**, which was recently re-named from PacificGOOS. The number of partners has greatly increased since it was formed in 1998. PI-GOOS helped to

develop the SEREAD project, which facilitates Argo deployments in the EEZs of the region. PI-GOOS also helped SOPAC to work with the Pacific Island States to develop an Ocean Policy for their region. The PI-GOOS Steering Committee meeting in Nadi, Fiji, in October 2002 resulted in creation of a project proposal to set up a Pacific Island ocean information system with accompanying staff support.

142 Mr. Bill Erb indicated that **Indian Ocean GOOS (IOGOOS)** is progressing well. The Memorandum of Understanding creating IOGOOS was signed during the IOGOOS Conference in Mauritius in November 2002. India provides a Secretariat in Hyderabad. The Conference itself was a landmark meeting for the Indian Ocean region and led to several working groups being set up to take forward developments in different topic areas such as capacity building in data and information management; one coastal GOOS project is already funded. In connection with the setting up of IOGOOS, an international cruise was organized for 45 days from India to Mauritius and back, primarily to promote cooperation in marine scientific research related to GOOS. Nineteen scientists from 6 regional countries participated in the cruise, conducting a wide range of oceanographic experiments including deployment of 10 Argo floats.

143 Mr. Erb noted that **Southeast Asia GOOS (SEAGOOS)** is still in a developmental stage. In the temporary absence of IOC staff from the WESTPAC Office in Bangkok, the development of SEAGOOS is in the hands of the Perth Office. A high-level summit meeting to garner support for SEAGOOS is planned for Kuala Lumpur on July 15, in parallel with a tropical cyclone modelling workshop.

144 Mr. Ilkay Salihoglu reported on **Black Sea GOOS**, where good progress is being made thanks to the success of the ARENA proposal through which funds were won from the EC. Surface drifters and Argo floats are being used to understand the circulation. Black Sea GOOS is working, together with MedGOOS, to develop an integrated eastern Mediterranean-Black Sea-Caspian Sea project.

145 Mr. Eric Lindstrom presented a summary of **US GOOS** activities, now organized by an Ocean US Office. He noted that there are now several regional observing systems developed or developing in the US, like the Gulf of Maine Ocean Observing System (GO-MOOS), and that Ocean US are promoting the grouping of these activities into a national federation of regional observing systems. The functions of this federation and criteria for participation are now being defined. He displayed a series of charts showing the spread of observing stations both offshore and onshore around the USA, noting the importance of land data on stream flow for assessing inputs from the land to the ocean. He also noted that education and outreach were important priorities in Oceans US, and that a full time Ocean US education coordinator had just been named. US GOOS is reaching out to develop over the next few years a North American GOOS Regional Alliance that would involve Canada and Mexico and other potential partners. The various US regional associations already work closely with international partners at their borders. It is hoped that these relationships can be integrated into a more formal multi-national partnership or regional alliance with US GOOS providing the core.

146 The Committee noted that plans are being made for a meeting in Colombia in May to take forward the development of a GOOS for the **Southeastern Pacific**.

147 The Committee noted from the various regional presentations that all the GRA's are developing in a manner that progresses from having meetings of people with common interests to define their GOOS objectives and organizing pilot projects. The process then results in drafting strategic and implementation plans, inventories of capabilities and capacity building requirements, setting up web sites, establishing secretariats, awareness building, planning meetings and workshops, etc. and shared GOOS activities. All the presentations included these common themes albeit in various stages of development. The Committee was pleased that the GRAs appeared to be developing according to GOOS Principles and in line with the GOOS Regional Policy and in sum represent a major contribution to GOOS, and in addition recognized that the GRAs are already working for and promoting the development of GOOS. The Committee noted that the cooperation envisaged in the GRAND proposal will contribute to spread best practice and build capacities.

148 The Committee noted that the IOC has established two regional offices to support the development of GOOS. The Committee noted the report of Mr. Bill Erb on the Perth Office, which was established in Perth, Western Australia, and is supported by the Government of Western Australia, the Commonwealth of Australia (through the Bureau of Meteorology) and the IOC. It has assisted development of Indian Ocean GOOS, PacificGOOS and SEA-GOOS. The Committee also noted the report of Mme Janice Trotte on the Rio GOOS Office, which was established in Rio de Janeiro, and is supported by the Brazilian Department of Hydrography and Navigation (DHN), and the IOC, with the aid of contributions made by the US National Oceanic and

Atmospheric Administration (NOAA). The Office has been assisting in the development of GOOS activities in the South Atlantic and with PIRATA, including its envisaged enhancements as an observing system in the region.

149 The Committee commended the two officers on having made impressive achievements in a relatively short time. The Committee also recommended the Rio Office to focus on strengthening the relations between Brazil, Uruguay and Argentina for a further development of a regional GOOS alliance. Argentina noted its plans to expand its network of tide gauges in the region.

150 The Director of EuroGOOS, Mr. Hans Dahlin, reminded the Committee that the International Council for the Exploration of the Sea (ICES) and the IOC now have a joint ICES/IOC Steering Group on GOOS, of which EuroGOOS is a Member, to help to bring the GOOS approach into ICES and to make ICES agencies observations available to GOOS. A first product of this group is a joint ICES/EuroGOOS North Sea Ecosystem Pilot Project, which is designed to demonstrate the usefulness of the GOOS methodology in support of an ecosystem-based approach to fisheries and environmental management for the North Sea. Similar GOOS/ecosystem pilot projects are being considered by the ICES/IOC Group for the Gulf of Maine (between Canada and the USA) and for the Bay of Biscay (between France and Spain). In addition ICES shares an interest with GOOS in the development of a regional GOOS at the Atlantic Basin scale.

151 The Committee noted progress with the connection to ICES.

152 Following the GRA presentations, I-GOOS agreed on the following actions:

The Committee:

1. Endorsed the present GRAs and approved their reports.
2. Noted with appreciation the plans for the establishment of a South Atlantic GOOS and of South East Pacific GOOS.
3. Welcomed the work of the Rio GOOS Office and noted the interest of Argentina in particular regarding its GOOS and GLOSS activities.
3. Noted the regional needs of the GRAs as expressed in the 1st Regional Forum (Annex VI), and encouraged developed Member States to assist in meeting those needs.
4. Noted and supported the plan for a joint project (GRAND) linking all GRAs, and interested Member States that are not yet part of a GRA, to establish a network to learn from each other, build capacity and contribute together to the global planning for GOOS.
5. In general terms, noted the progress by Member States at regional level in building the institutional infrastructure and the science and technology base for the implementation of GOOS, and recognized the need for long-term marine observations to get the full benefits of efforts by Member States.
6. Recommended that full use be made of the existing regional subsidiary bodies of the IOC in building new GRAs and in the work of the existing ones.
7. Endorsed the holding of the 2nd Regional GOOS Forum in the Pacific, noting that the I-GOOS Board's planning for the Regional Forum in the Pacific should involve SOPAC, Pacific Islands GOOS, the Perth Office, the WESTPAC Office and the GPO.

10.3 REGIONAL POLICY

153 The past I-GOOS Chair, Mr. Angus McEwan, reminded the Committee of the details of the proposed policy governing the regional development of GOOS.

154 The Committee recommended that the IOC Assembly endorse the proposal with one modification, to clause 4.2, to ensure that it was I-GOOS alone that carried the responsibility for terminating any GRA. The accepted version is attached to the report of the meeting as Annex VII. Assuming that the Policy is approved, the Committee recommends that IOC approve the existing GRAs.

155 In discussing how GRAs might develop the Committee noted that GOOS-AFRICA might well be expected to develop like EuroGOOS, with discrete subregional bodies in discrete geographic regions (e.g. NOOS and BOOS in Europe; Benguela and Gulf of Guinea in Africa).

11. STATUS OF GOOS IMPLEMENTATION AT THE NATIONAL SCALE

11.1 STATUS OF NATIONAL GOOS CONTACTS

156 The Director of the GPO drew attention of the Committee to the national GOOS contacts list on the GOOS web site and asked Member States to ensure that it accurately reflected their positions.

11.2 STATUS OF NATIONAL GOOS REPORTING

157 The Director of the GPO noted that national reports had been received for I-GOOS-VI from the following countries (Canada, Cuba, France, Germany, Iceland, India, Japan, Kenya, New Zealand, Norway, Poland, the Russian Federation, Spain, and the Ukraine). The Committee urged other Member States to keep the GPO abreast of their developments by using the template for national reporting.

158 MedGOOS noted that it will be providing national reports from the region, since it is presently collecting inventories and reports from all Mediterranean countries. Portugal noted that it has established two working groups on GOOS, to deal with coastal matters including pollution, and with climate. Brazil noted that a report was already on its way.

11.3 STATUS OF NATIONAL GOOS COMMITMENTS

159 Mr. Bert Thompson, Consultant, reported on the information he has gathered in his search to flesh out the provisional lists of commitments made at the 1st GOOS Commitments meeting in July 1999, and on the efforts he has made to find additional contributions to GOOS from national activities. His efforts include documenting, assessing and tracking commitment efforts since mid 2001. Some information on observational programme trends and trends in data delivery (GTS and DM) for international use were provided. These had previously been examined by GSC-VI (actions 32 and 33, in Annex V), which called on JCOMMOPS to cross check Mr. Thompson's estimates of the trends. GSC-VI also called on JCOMMOPS to develop a method for demonstrating the volume flow of data over time and to provide regular statistics to JCOMM and GOOS on system performance. JCOMM recognizes the importance of data flow monitoring and has agreed to continue participation in those activities.

160 Another observational component that needs immediate attention is completion/upgrade of the GLOSS – Ocean Climate (OC) network. It is presently operating in fast mode at 33% and will not be available in full for use in GODAE as hoped in 2003. Special efforts should be made by GLOSS to determine whether sites can be upgraded to meet GODAE or future OC requirements and to identify impediments to doing so if they cannot be upgraded.

161 The submission of national reports has been useful in identifying initial commitments to GOOS, but as the regional components of GOOS develop, and the Global Observing PSystem Information Centre (GOSIC) becomes fully operational, it seems appropriate to take advantage of both to improve the flow of information on commitments and operations. GOSIC can establish a single web page for each Member State that includes information similar to the contents of the attached national profiles. These pages could be kept current through frequent (quarterly or when significant changes take place) coordination between national contacts, regional programme managers and GOOS data coordinators. By including these pages in GOSIC, national contacts and

others knowledgeable in specific observational programmes could be directed to a web site that puts their efforts in the context of the overall programme. If this suggestion is accepted, the present form of reporting would no longer be necessary after submission of the 2002 reports already solicited by GPO for I-GOOS-VI.

162 This proposal has far reaching ramifications, including those on the staffing for the assessment activity (presently Bert Thompson) and the sustainability of GOSIC. Funds for both activities will be exhausted by the end of 2004. It was suggested that a full time data coordinator (as specified in the GOOS data management plan) be recruited to undertake the assessment activity which will be relinquished by Bert Thompson in 2003. See GSC-VI action 32 (Annex V).

163 The Committee agreed to consider developing a mechanism for compiling and analyzing all national contributions to GOOS, including the data collected by GRAs, so as to be able to provide a comprehensive annual reports on the status of the observing system [Refer to action 34 of Annex V].

164 The Committee agreed that both the assessment and GOSIC issues require immediate attention and decided to form an inter-sessional working group to review the future activities and funding, including personnel and facilities of the assessment and GOSIC activities.

12. DATA AND INFORMATION MANAGEMENT AND POLICY

12.1 OCEANOGRAPHIC DATA POLICY

165 Mr. Angus McEwan, Chairman of the IOC's working group on ocean data policy reported on this item. The Thirty-third session of the IOC Executive Council (June 2000) decided through its resolution XXXIII.4 to establish an inter-sessional Intergovernmental Working Group on IOC Oceanographic Data Exchange Policy. The Working Group had convened meetings, in Brussels (March 2001) and in Paris (June, 2002), and has agreed on a proposed data policy that will be put forward as a resolution to the 22nd IOC Assembly. Mr. Angus McEwan gave a brief overview of the proposed data policy and tabled the document. The proposed policy was discussed at IODE-XXVII (March 2003) where it was accepted in unmodified form. The Committee expressed support for the data policy, noting that any policy is only as effective as its implementation, and called on Member States to ensure compliance. Some delegations expressed the need of specific national consultation on the proposed text before presentation at the 22nd IOC Assembly.

12.2 DATA AND INFORMATION MANAGEMENT

12.2.1 Progress with GOSIC

166 On behalf of Mr. Ron Wilson, Mr. James Crease gave an overview of the status report for the Global Observing Systems Information Centre (GOSIC). GOSIC is hosted at the University of Delaware and provides a window into GOOS metadata (<http://www.gos.udel.edu>). The report reiterated the need for the Global Observing Systems Information Centre (GOSIC) as an element of the G3OS, presented recent progress and plans, discussed the issue of communication with the panels and steering committees of the parent bodies, and provided an assessment of GOSIC.

167 Mr. Crease highlighted two issues for the committee:

(i) Guidance and communications with the G3OS programmes

In the early years of the existence of the programme GOSIC representatives presented progress reports at steering committee meetings but since 2000 this has been reduced from attendance to the submission of written reports. Little feedback or guidance has been received, except from the standing review panel that was established by the three steering committees. To further improve guidance it would also be useful if the standing review panel could conduct another review of GOSIC in 2003.

(ii) Transfer of GOSIC to an operational agency

The plan for development and implementation of GOSIC includes two 3-year developmental phases followed by a 2-year phase during which the system is to be transferred to an "operational agency" for operation into the future.. A process has to be chosen that is fair and will result in selecting an agency

with the capability to carry out the programme.

168 The Committee endorsed the suggestion of a review of GOSIC in 2003, and agreed to draw to the attention of the IOC Assembly the need for a Member State to accept operational responsibility for GOSIC.

169 The Chair of IODE reported that IODE XVII had expressed an interest in supporting GOSIC. She offered to investigate the possibility of one of the IODE Centres hosting GOSIC. The Committee thanked the Chair of IODE for the offer, and pointed out that GOSIC included both atmospheric (GCOS) and terrestrial (GTOS) responsibilities as well. The Centre hosting GOSIC will have to take these additional responsibilities into account.

12.2.2 Links to IODE

170 The IODE Chair, Mme Lesley Rickards, introduced this Agenda Item. She recalled that the main objectives of IODE are (i) to facilitate and promote the exchange of oceanographic data and information; (ii) to develop standards, formats and methods for the global exchange of oceanographic data and information; (iii) to assist Member States to acquire the necessary capacity to manage oceanographic data and information and become partners in the IODE network; and (iv) to support international scientific and operational oceanographic programmes of IOC and WMO and their sponsor organizations with advice and data management services.

171 Composed of DNAs, NODCs, RNODCs and WDCs Oceanography, the global IODE Network of over 60 data centres has operated for over 40 years. It has collected, quality controlled and archived millions of ocean observations; supported several international science programmes; and assembled and published many project datasets for national and regional projects.

172 IODE is now seeking ways to meet the changing needs of its traditional and new user communities, taking into consideration the changes in technology, users needs and capacity building.

173 She then proceeded giving a brief overview of some core elements of the IODE programme. With regard to global data projects Mme Rickards referred to the Global Ocean Data Archaeology and Rescue (GODAR), and its regional components such as MEDAR and WESTPAC-GODAR, the Global Temperature and Salinity Profile Project (GTSPP), and the newly established Global Ocean Surface Underway Data (GOSUD) project.

174 She informed the Session that, in order to streamline existing structures and maximize their effectiveness, IODE-XVII and the JCOMM Management Committee (Second Session) had now recommended the merging of the IODE Group of Experts on Technical Aspects of Data Exchange (GE-TADE) and the JCOMM Expert Team on Data Management Practices (ETDMP). IODE-XVII adopted a Recommendation in this regard. Further in the field of information technology, she reported that IODE is a partner in both the ICES-IOC Study group on the Development of Marine Data Exchange Systems using XML (SGXML) and the EU funded Marine XML Project. IODE-XVII had also recommended that the IODE be a co-sponsor of the Ocean Information Technology (OIT) Pilot Project, jointly with JCOMM and GOOS. JCOMM and IODE are also jointly sponsoring several other projects.

175 Mme Rickards called the attention of the Session to the strong capacity building programme of IODE, referring to OceanTeacher, ODINAFRICA and ODINCARSA, MEDI and OceanPortal. She welcomed that IODE is a member of the GOOS Capacity Building Panel and the JCOMM Capacity Building Coordination Group (which were now also merged).

176 Mme Rickards also informed the Session that, to provide an operational environment for many of these activities and their management, IODE-XVII had recommended the establishment of an IODE Project Office.

177 The IODE Chair informed the Session that, whereas IODE had in the past mainly concentrated on physical oceanography data, the newly established IODE Group of Experts on Biological and Chemical Data and Exchange Practices (GE-BCDMEP) was now giving attention to the exchange and management of these increasingly important data. She noted that one of the first major actions in this field had been the co-sponsoring of the "Colour of Ocean Data Symposium", held in Brussels, Belgium, 25-27 November 2002. Bringing together data managers, scientists and users, the event had been very successful and had made important recommendations to IODE-XVII.

178 With regard to cooperation between IODE and GOOS, Mme Rickards stated that IODE data centres are an integral part of GOOS through their involvement in e.g. Argo, GLOSS, etc. IODE can also assist GOOS with capacity building through its different projects, services and products mentioned above, and by making (operational) data available to developing countries. The overlapping and complementary interests between GOOS, JCOMM and IODE have been well recognized by IODE-XVI and IODE-XVII and IODE-XVII has now established an *ad hoc* working group to consider the implications of GOOS and JCOMM development on IODE.

179 Mme Rickards concluded by stating that GOOS presents many challenges to IODE, IODE will continue to adapt to meet these, and IODE also has a lot to offer to GOOS. The challenge for GOOS, JCOMM and IODE will be to find the most effective way to utilize the IODE resources.

180 The Committee welcomed the progress of IODE as a response to the request of the IOC Assembly to adapt IODE to new requirements and new technologies, but called on IODE to preserve also its unique role and legacy as an important IOC Programme.

181 The Committee welcomed the proposed merger of the IODE GE-TADE and JCOMM ETDMP and called for further streamlining and optimization of GOOS, JCOMM and IODE subsidiary bodies in the field of ocean data and information management.

182 The Committee welcomed the recommendation of IODE to establish an IODE Project Office.

183 The Committee noted with appreciation the important efforts made by IODE in the area of biological data management but called on IODE to make similar efforts for chemical data, including pollution data as these are of great importance to the Coastal Module of GOOS.

184 The Committee expressed its appreciation for the OceanTeacher system but called on IODE to include courses to train scientists on the importance of data and information management (also a recommendation of the Colour of Ocean Data Symposium).

12.2.3 The Ocean Information Technology Project

185 Under this item, Mr. Neville Smith reported on progress with and plans for the Ocean Information Technology (OIT) Project, which is investigating ways in which novel technologies can be adapted by the ocean community to handle the rapidly increasing torrent of data from *in situ* and remote sensing observational devices. The Project was now endorsed by the GSC, IODE and JCOMM, and formed one of the pilot projects of GOOS. A Steering Team had been created (with Mr. N. Smith as chair), and held its first meeting in Brussels on November 29, 2002). The objective is to approach OIT as one would a Science Programme, addressing the demand for effective telecommunications; the need for common standards, practices and protocols (metadata management); the need for data and product service matched to the participants and users of GOOS data; the need for innovative data inquiry, access and delivery mechanisms; and the need for intra-operability and interoperability.

186 The Brussels meeting provided a strong and unanimous mandate to proceed with the OIT Pilot Project, with a focus in terms of capacity and functionality. The main focal points should be: (i) to initiate an OIT Metadata Management Project to develop a metadata model, working with XML (the medium term goal is to convene a Workshop around 10-12 months from now); (ii) data transport and communication (servers, protocols for exchange); (iii) the assembly and integrity of data sets (with an orderly process for quality control and assurance, building on the experience with Argo).

187 Strong links must be developed between national/regional initiatives and the OIT, and the plans for OIT should take advantage of existing national activities and relevant international activities.

188 The Committee noted that the project offered a quantum leap in improvements to the ways in which marine science in general, and GOOS and JCOMM and IODE in particular, handle data and information. The Committee enthusiastically endorsed the progress and plans proposed, and agreed to urge Member States through the IOC Assembly to support the development of this innovative project.

13. CAPACITY BUILDING

13.1 REPORT OF CAPACITY BUILDING PANEL MEETING

189 Mr. Craig Donlon, Vice Chair of the GOOS CB Panel, reported on the results of the 1st meeting of the GOOS Capacity Building (CB) Panel (Geneva, 24-26 June 2002), which took place in parallel with the 1st meeting of the JCOMM Capacity Building Coordination Group so as to ensure synergy between the activities of the two groups.

190 , The Committee noted and endorsed the proposal of JCOMM and the GSC to combine the activities of the two capacity building groups (JCOMM and GOOS), whenever appropriate, taking into account the broader spectrum of activity of GOOS with respect to JCOMM (see also action 37 of Annex V).

191 The Committee agreed that the Chair of the GOOS CB Panel or his/her representative should report on progress and plans to I-GOOS and be part of the Regional GOOS Forum [Refer to action 39 of Annex V].

13.2 THE CAPACITY BUILDING ACTION PLAN

192 Mr. Donlon outlined the main points of the GOOS CB Action Plan, reproduced in this report as Annex VIII.

193 The Committee noted and endorsed the main thrusts of the Action Plan (on remote sensing, *in situ* observations, modelling and forecasting, and data and information management), agreeing that it is critical to assist developing countries to gain access to and training in the use of remotely sensed data from satellites, in support of sustainable development.

194 The Committee noted that CB should also focus on the provision of equipment (such as Argo floats, and tide gauges), combined with training in its use, and the provision of maintenance for the long term.

195 The Committee saw the need for detailed appraisals of the needs of specific regions, and noted that this aspect was already being addressed through the activities of some GRAs, such as MedGOOS and others, and by thee JCOMM Capacity Building Coordination Group for the WMO regions. .

13.3 STATUS OF CAPACITY BUILDING ACTIVITIES

196 Mr. Donlon gave a short introduction to the UNESCO Bilko programme for learning in remote sensing. Bilko is a Virtual Global Faculty for Marine and Coastal Remote Sensing. It has a modular structure that can be adapted easily to focus on regional and national GOOS needs. Over 1900 users are currently registered. While the Bilko had been developed by UNESCO's Marine Science programme, and used actively by UNESCO's CSI, there was ample scope for it to be used to support IOC's endeavours to enhance the ability of developing country scientists to access and use remotely sensed data and convert it into information products for decision makers.

197 The Committee noted the possibilities of Bilko for all GRAs, and that it was already being considered as a key tool for raising competence in the use of remotely sensed data by GOOS-AFRICA, and agreed that it should be used as one of the IOC's tools for capacity building in support of GOOS.

198 IODE noted that the ODIN formula, as used to develop ODINAFRICA, and in future ODINCARSA, was an additional important tool for building the capacity of developing countries. IODE has also developed the Ocean Teacher programme as a training tool that is modular in character, and that can be adapted to include GOOS modules. IODE drew the attention of the Committee to the fact that most oceanographic training programmes in universities do not have any element dealing with ocean data and information management, which may partly help to explain why marine scientists tend not to pay sufficient attention to data and information management.

199 The Committee noted the need for the IOC Assembly to urge Member States to provide university level training courses in data and information management.

13.4 EUROPEAN COMMISSION

200 Mr. Alan Edwards, European Commission, provided an introduction to (i) ERA-NET programme and (ii) an update to the Global Monitoring for Environment and Security (GMES) – two programmes which may provide avenues for funding of GOOS activities.

201 The ERA-NET scheme is a way for the EU Sixth Framework Programme (FP6) to support the co-operation and co-ordination of research activities carried out at national or regional level, as part of the initiative 'Integrating and strengthening the European Research Area'.

202 The objective of the ERA-NET scheme, in the context of the European Research Area (ERA), is to step up the co-operation and co-ordination of research activities carried out at national or regional level in the Member States and Associated States through:

- The networking of research activities conducted at national or regional level;
- The 'mutual opening' of national or regional research programmes which will be part of the networking activities.

203 Depending on the degree of maturity of the network, some or all of the following activities could be envisaged in an ERA-NET:

- Systematic exchange of information (i.e. *fora* of research programme makers and managers; short-term exchanges of programme managers; benchmarking and dissemination of 'good practices');
- Strategic activities (i.e. identifying and/or analyzing synergies among ERA-NET partners, research leading to future multinational programmes, networking activities and 'mutual opening' mechanisms, administrative and legal barriers, new research;
- Implementation of joint activities (i.e. clustering of current nationally-funded research projects; systematic use of multinational evaluation procedures; joint training activities, 'mutual opening' of facilities or laboratories);
- Transnational research.

204 Participation in ERA-NET is open to:

- Public bodies responsible for financing or managing research activities carried out at national or regional level;
- Other national bodies that finance or manage such research activities, e.g. research associations, private research and innovation organizations, and charities;
- Bodies operating at European level whose mission includes the pan-European co-ordination of nationally-funded research.

205 More information on ERA-NET is available at: http://europa.eu.int/comm/research/fp6/era-net.html.

206 GMES is a joint initiative with the European Space Agency (ESA) with the overall aim being to support Europe's goals regarding sustainable development and global governance by facilitating and fostering over the

next decade the provision of high quality data, information, and knowledge. Specifically GMES aims at establishing by 2008 an operational and autonomous European capacity for global monitoring of environment and for civil security. It is a European contribution to the global observing systems.

207 An Initial Period (2001-2003) has been launched to prepare for an implementation phase from 2004-2008. The plan is to build on existing infrastructures and capabilities and complement where needed.

208 More information on GMES is available at: http://www.cordis.lu
http://europa.eu.int/comm/space/prog/gmes/gmes_en.html

14. LIAISON AND INTEGRATION

14.1 GCOS, GTOS

209 Colin Summerhayes, reporting on behalf of Mr. Paul Mason, indicated that GOOS has worked with GCOS and GTOS to draft a report on the adequacy of the entire observing system for climate for submission to the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC). Thus GOOS requirements will be brought to the highest level of attention. COP has requested member states to prepare action plans on how they are meeting the requirements of the global climate monitoring system, noting that GOOS is the ocean component of the system. GCOS is presently analyzing these plans.

210 The GEF has provided GCOS with funding to conduct a series of capacity building workshops to determine the needs of the regions. GOOS has worked closely with GCOS to ensure that oceans are adequately addressed in that process.

211 The main interactions with GTOS have been through the Coastal GOOS Panel (COOP). The requirements for the common monitoring of sites are being reviewed. GTOS is expected to produce a comprehensive plan in the next few years.

212 The Committee noted these developments and also that CEOS too is working on the common remote sensing observations required for the Integrated Observing System.

14.2 UN (Conventions, UNEP Regional Seas, IOC, FAO Regional Programmes)

213 The UNEP representative, Mr. Luc St Pierre, underlined the close coordination existing between the Caribbean Environment Programme, coordinated by UNEP and the Caribbean (IOCARIBE), confirmed by the signature of a Memorandum of Cooperation in 2002. He also informed representatives that UNEP will submit a Memorandum of Understanding with IOC/GOOS for consideration by the next IOC Assembly in June/July 2003.

14.3 ICSU (SCOR), WCRP (CLIVAR), IGBP, POGO, CO_2 PANEL

214 Colin Summerhayes noted that ICSU is a co-sponsor of the GOOS scientific advisory bodies, GSC, COOP and OOPC. SCOR assists in identifying members for these various panels. ICSU, GOOS and SCOR are also linked through the IOC's co-sponsorship with SCOR of the CO_2 Panel, which is studying the best observation system for ocean carbon. Links to the interests of the International Geosphere Biosphere Programme (IGBP) come about through interactions between COOP and LOICZ and GLOBEC.

215 The Committee noted that IOC's Member States and GOOS sponsors are also used to help identify potential panel members.

216 The Partnership for Observation of the Global Oceans (POGO) has been formed by the directors of leading oceanographic institutions and agencies. It has been advising on GOOS activities and assisting with capacity building. Tom Malone, Patricio Bernal and Bill Erb attended the last POGO meeting in Hobart to ensure adequate interaction with GOOS.

15. GOOS INFRASTRUCTURE

15. 1 REPORT OF THE GOOS PROJECT OFFICE

217 Mr. Summerhayes reported on the status of the GOOS Project Office. Staff effort now amounts to ten person-years. The Paris staff is down by one, which puts pressure on staff at headquarters as GOOS continues to grow. The Offices in Rio and Perth have helped to manage the growth in regional activities. New activities, that help to create pressure on headquarters staff, include the setting up of JCOMM, IGOS, GRA's, I-GOOS Board, Regional GOOS Forum, CB Panel and the GOOS Review.

218 The Committee noted that the USA has offered a secondment beginning in June 2004 for a fourteen-month period to assist with the JCOMM meeting planned for Canada in 2005 and thanked the USA for their support. The Committee noted that the UNESCO Young Professional Programme has provided Ms. Boram Lee from Korea to assist with JCOMM programme, and requested the IOC to maintain this post.

219 The Committee noted that GRAs were now providing (or seeking for) funds for their own support, which would help take some pressure off GPO staff.

220 The Committee thanked Japan for continuing its provision of an associate expert to the GPO and the USA for funding the Technical Secretary of the OOPC.

221 The Committee warmly appreciated the hard work of the GPO team and thanked the Director, Mr. Summerhayes, for his dedicated and outstanding leadership of the Office. It noted that Member States must contribute and assume responsibility for the international coordination that is essential for the continued successful growth and development of GOOS, including its implementation through JCOMM. The Committee noted also that the impact of the return of the USA to UNESCO needed to be assessed.

15.2 WORK PROGRAMME AND BUDGET

222 Mr. Summerhayes reported on the proposed work programme and budget for international GOOS coordination.

223 The members of the sessional working group on programme and budget recommended that the programme and budget for 2003 should be endorsed by the Assembly, taking into account the following considerations:

(i) The total IOC GOOS budget is close to two million dollars, of which one million is spent on salaries. The other million comes from the IOC Regular Programme Budget ($342 K) and extra-budgetary resources ($620 K). The GOOS regular budget is generated by the IOC GOOS allocation and contributions from Ocean Climate, TEMA and Regional funding on issues related to GOOS. Zero-nominal growth is expected for the next biennial budget (2004/2005).

(ii) The present allocation of 28% of the GOOS Programme Budget for the Science Guidance Panels should decrease considerably in 2004 if I-GOOS approves the final draft of the COOP implementation plan. The number of GOOS Science Guidance Panel meetings should be reduced to a minimum to free resources.

(iii) The GOOS budget should support an increasingly active GOOS infrastructure by redistributing the funding saved from Design Panels envisaged under (ii) above to Implementation Oversight and Capacity Building.

(iv) The GPO Director should aim to make use of GSC and I-GOOS board members to attend and report at meetings instead of GPO staff. This action will free up the GPO staff time for other activities. In addition, representatives to participate in the meetings should be selected (who do not need to travel a long distance) so that travel costs could be minimized. The GPO Director should be requested to report on the results of this initiative at the next I-GOOS meeting.

(v) The IOC Executive Secretary should be urged to strongly request Member States to give in-kind support to GPO by the virtual secondment of experts to help the GPO Director carry out some actions required by GSC, I-GOOS, I-GOOS Board and JCOMM Management Committee, such as developing the new GOOS Strategy, writing The GOOS 2004 and developing the GOOS brochure (such virtual secondments envisage the experts remaining in their home institutions while working part-time for the GPO).

(vi) The IOC Executive Secretary should be urged to allocate a substantial proportion of the time (50%) of the new P-5 TEMA staff member to support GPO efforts to secure/request additional external funding for Capacity Building and to help run the Capacity Building component of GOOS. The request should stress that the GOOS is the "IOC Flagship" and therefore, it should have a high priority among the IOC Capacity Building activities.

224 The Committee expressed its appreciation to the representatives of Brazil, France, Germany, USA and Chile who participated in the review of the I-GOOS 2003 Programme and Budget.

225 The Committee endorsed the work programme and budget, with the above provisions.

226 The Committee agreed that: (i) the IOC should review more cost effective way of covering the growing number of GOOS related meetings; (ii) the IOC should investigate secondment possibilities and broader base of external funding; (iii) a forecast of future secured funds should be presented as part of the work programme and budget; and (iv) strong representation should be made to IOC on the need for continuity in the role of the head of the GPO [Refer to action 35 of Annex V].

227 The Committee agreed to request the Executive Secretary of the IOC to give a high priority to working with Member States to ensure that the GPO is resourced with personnel at a level adequate to the tasks required of it by Member States, noting that staff could be made available through virtual secondments (hence working in their own offices, rather than in Paris, for the GPO) [Refer to action 4 of Annex V].

228 The Committee agreed to request the Executive Secretary of the IOC to make available to the GOOS Capacity Building (CB) programme an appropriate proportion of the time of the new IOC P5 grade post in CB when the new recruit arrives in post later this year [Refer to action 7 of Annex V].

15.3 COMMUNICATION AND INFORMATION

229 Mr. Summerhayes reported on developments in communicating information about GOOS. To help to develop an international GOOS network, the I-GOOS Board (Paris, 2-3 June 2002) recommended that the GPO should regularly inform national and regional GOOS contact points about GOOS developments. To meet this requirement the GPO developed a set of list servers that will enable GOOS News-Flashes to be sent at frequent intervals to different elements of the GOOS Community including: (i) national GOOS focal points; (ii) regional GOOS chairs and technical secretaries; (iii) attendees at I-GOOS meetings; (iv) members of GSC; (v) members of COOP; (vi) members of OOPC; (vii) members of the GOOS CB Panel; (viii) the GPO and its regional representatives. The first GOOS News-Flash was sent out in October 2002. Some people appear on more than one list, which means a certain amount of unavoidable duplication. Recipients are asked to pass the News-Flashes on to their national communities. They are also encouraged to use the lists to send their own News-Flashes. Owing to staff pressures there had been little progress with the development of a GOOS Brochure, a Biennial GOOS Status Report, or the Biannual GOOS Newsletter. Delays in production of the electronic GOOS Products and Services Bulletin had been solved by the offer of assistance from Texas A & M University. Improvements to the web site had been made, including making available copies of powerpoint presentations for use by Member States and GRAs. Mr. Summerhayes urged representatives at the meeting to use these slides to make their own presentations in their own languages to raise awareness at the national level.

230 The Committee noted developments and endorsed publication of the GOOS News Flashes.

231 The Committee also noted that each GRA either has developed or is developing a web page, and is engaged in awareness raising activities of a variety of kinds.

232 The Committee agreed that the I-GOOS Board should be consulted in the work of the GSC and JCOMM to develop a communications strategy [Refer to action 22 of Annex V].

233 The Committee also noted the formation of an intersessional Editorial Group to Update "The GOOS 1998", and agreed with the representation of I-GOOS on that group by the I-GOOS Chair [Refer to action 45 of Annex V].

16. REVIEW OF ACTIONS AND ISSUES

16.1 ACTIONS FOR 2001-2003

234 Mr. Summerhayes reviewed progress against actions for 2001-2003. The Committee noted that well over 80% of the actions from I-GOOS-V had been achieved, and many of the remaining ones were in progress.

16.2 REVIEW OF MAJOR ISSUES FOR 2003-2005

235 Based on the list of key issues, and on the results of the present meeting, the I-GOOS Chair invited discussion on the major issues for I-GOOS for 2003-2005. The Committee agreed that these were as spelled out in agenda item 3.

16.3 ACTIONS FOR 2003-2005

236 The list of actions is presented in Annex IX.

17. ELECTION OF CHAIRPERSON AND VICE-CHAIRPERSONS

237 The Committee unanimously re-elected Mme Silvana Vallerga (Italy) to continue as Chairperson, and Mr. Rodrigo Nunez (Chile) to continue to serve as one of the Vice-Chairpersons, with Mr. Guillermo-Garcia (Cuba) as the second of the Vice-Chairpersons to hold office until the end of its next session.

238 The Committee thanked Mme Janice Trotte warmly for her activities as I-GOOS Vice Chairperson for the past two years, noting that her present tasks as a part-time member of the IOC Secretariat in charge of the Rio GOOS Office made her ineligible to continue in this role.

18. REVIEW OF THE REPORT OF THE MEETING

239 The draft summary report of the session, as prepared by the GPO and reviewed by the Rapporteur, was reviewed and finalized during the last part of the meeting, in English only. The Committee approved the final text of the report of the meeting, subject to minor modifications requested from the Secretariat for clarification and to remove factual errors.

240 The Committee decided to submit to the IOC Assembly a Draft Resolution given in Annex X and requesting (i) acceptance of this report and its recommendations, and (ii) specific actions by the Executive Secretary of the IOC relating to the need for resources for GOOS coordination and capacity building.

19. NEXT SESSION OF THE IOC-WMO-UNEP COMMITTEE FOR GOOS (I-GOOS-VII)

241 The Committee decided that its next session will be held in Paris in March 2005.

20. CLOSURE OF THE SESSION

242 The sixth session was closed at 5 pm on Friday, 14 March 2003. The Chairperson thanked the Member States for their enthusiastic and proactive participation, and the IOC staff and UNESCO translators who helped to make the meeting a success, and looked forward to seeing considerable progress by the time of I-GOOS-VII.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA
2.2 DESIGNATION OF A RAPPORTEUR
2.3 CONDUCT OF THE SESSION

3. REPORT OF THE CHAIRPERSON

3.1 ACTIVITY OF THE I-GOOS BOARD
3.2 ACTIVITY OF THE WORKING GROUPS
3.3 THE GOOS REGIONAL FORUM

4. GOOS AND THE WSSD

5. THE REVIEW OF GOOS STRUCTURE, MANDATES AND MODUS OPERANDI

6. RESOURCES WORKING GROUP

6.1 TERMS OF REFERENCE AND MEMBERSHIP
6.2 ACTIVITIES OF THE RESOURCES WORKING GROUP

7. UNCLOS, I-GOOS AND ADVICE TO ABE-LOS

8. STATUS OF GOOS PLANNING

8.1 THE GOOS STEERING COMMITTEE
8.2 THE OPEN OCEAN: OOPC
8.3 THE COASTAL OCEAN: COOP

9. STATUS OF GOOS IMPLEMENTATION AT THE GLOBAL SCALE

9.1 THE *IN SITU* ELEMENTS OF THE OBSERVING SYSTEM
9.2 JCOMM
9.3 SPACE-BASED MEASUREMENTS AND THE IGOS PARTNERS
9.4 PILOT PROJECTS
9.4.1 GODAE and ARGO
9.4.2 PIRATA
9.4.3 WIOMAP and others

10. STATUS OF GOOS IMPEMENTATION AT THE REGIONAL SCALE

10.1 REPORT OF THE 1ST REGIONAL GOOS FORUM
10.2 REGIONAL GOOS DEVELOPMENTS
10.3 REGIONAL POLICY

11. STATUS OF GOOS IMPLEMENTATION AT THE NATIONAL LEVEL

11.1 STATUS OF NATIONAL GOOS CONTACTS
11.2 STATUS OF NATIONAL GOOS REPORTING
11.3 STATUS OF NATIONAL GOOS COMMITMENTS

12. DATA AND INFORMATION MANAGEMENT AND POLICY

12.1 OCEANOGRAPHIC DATA POLICY
12.2 DATA AND INFORMATION MANAGEMENT
12.2.1 Progress with GOSIC
12.2.2 Links to IODE
12.2.3 The Ocean Information Technology Project

13. CAPACITY BUILDING

13.1 REPORT OF CAPACITY BUILDING PANEL MEETING
13.2 THE CAPACITY BUILDING ACTION PLAN
13.3 STATUS OF CAPACITY BUILDING ACTIVITIES

14. LIAISON AND INTEGRATION

14.1 GCOS, GTOS
14.2 UN (Conventions, UNEP Regional Seas, IOC, FAO Regional Programmes)
14.3 ICSU (SCOR), WCRP (CLIVAR), IGBP, POGO, CO_2 PANEL

15. GOOS INFRASTRUCTURE

15.1 REPORT OF THE GOOS PROJECT OFFICE
15.2 WORK PROGRAMME AND BUDGET
15.3 COMMUNICATION AND INFORMATION

16. REVIEW OF ACTIONS AND ISSUES

16.1 ACTIONS FOR 2001-2003
16.2 REVIEW OF MAJOR ISSUES FOR 2003-2005
16.3 ACTIONS FOR 2003-2005

17. ELECTION OF CHAIRPERSON AND VICE-CHAIRPERSON

18. REVIEW OF THE REPORT OF THE MEETING

19. NEXT SESSION OF THE IOC-WMO-UNEP COMMITTEE FOR GOOS (I-GOOS-VII)

20. CLOSURE OF THE SESSION

ANNEX II

LIST OF DOCUMENTS[*]

Two kinds of documents were considered:

i. **Working Documents,** which directly informed the discussions during the meeting; *these documents appear in **bold** in the list below.*

ii. Background Documents, which provided more information about particular issues.

Document Code	*Title*	*Agenda Items*	*Languages available*
I-GOOS-VI/1 prov.	**Provisional Agenda**	**2.1**	**E F S R**
I-GOOS-VI/1 add. prov. rev.	**Provisional Timetable**	**all**	**E only**
I-GOOS-VI/2 prov.	**Annotated Provisional Agenda**	**2.1**	**E F S R**
I-GOOS-VI/2 prov. corr.	**Annotated Provisional Agenda - Corrigendum**	**2.1**	**E only**
I-GOOS-VI/3	**Summary Report of the Session** *(to be prepared during or after the Session)*	**all**	**E only**
I-GOOS-VI/4 prov.	**Provisional list of documents**	**all**	**E only**
I-GOOS-VI/5 prov.	**Provisional List of Participants**	**-**	**E only**
I-GOOS-VI/6 -	**Minutes of the First Meeting of the I-GOOS Board**	**3.1-3.3**	**E F S R**
B	**Minutes of the Second Meeting of the I-GOOS Board**		**E F S R**
I-GOOS-VI/7	**Pronouncements Relating to GOOS that Emerged from the WSSD**	**4**	**E F S R**
I-GOOS-VI/8 -	**Report of the GOOS Review Panel on the Structure, Mandates and *Modus Operandi* of GOOS - Draft**	**5**	**E F S R**
B	Draft Proposed Revisions to the Terms of Reference of I-GOOS, GSC and GPO, for Presentation to GSC-VI & I-GOOS-VI, as the Basis for an Annex to the Proposed Resolution on GOOS Structure for the IOC Assembly		E only
I-GOOS-VI/9	**Report of *ad hoc* Working Group of Experts on GOOS-UNCLOS**	**6**	**E F S R**
I-GOOS-VI/10	**Scientific and technical requirements of GOOS in relation to UNCLOS**	**7**	**E F S R**
I-GOOS-VI/11	Report of GSC-V (Paris, 1-3 May 2002)	8.1	E only
I-GOOS-VI/12	Report on Activities of the Ocean Observations Panel for Climate (OOPC)	8.2	E only
I-GOOS-VI/13A	COOP activities	8.3	E only
I-GOOS-VI/13B	Design of a GOOS for Coastal Seas (final version)	8.3	E only
I-GOOS-VI/14	Status of the Present Global Elements of GOOS	9.1	E only
I-GOOS-VI/15	Development of JCOMM	9.2	E only
I-GOOS-VI/16	Contribution to GOOS by remote sensing from satellites	9.3	E only
I-GOOS-VI/17	Global Ocean Data Assimilation Experiment (GODAE)	9.4.1	E only

[*] This list is for reference only. No stocks of these documents are maintained, except for the Summary Report.

Document Code		*Title*	*Agenda Items*	*Languages available*
I-GOOS-VI/18		Implementing the Argo Array	9.4.1	E only
I-GOOS-VI/19		PIRATA	9.4.2	E only
I-GOOS-VI/20		WIOMAP	9.4.3	E only
I-GOOS-VI/21		Report of the First Regional GOOS Forum (DRAFT)	10.1	E only
I-GOOS-VI/22		NEAR-GOOS Report (Revised)	10.2	E only
I-GOOS-VI/23		EuroGOOS Report	10.2	E only
I-GOOS-VI/24		MedGOOS Report	10.2	E only
I-GOOS-VI/25		IOCARIBE-GOOS Report	10.2	E only
I-GOOS-VI/26		PacificGOOS Report	10.2	E only
I-GOOS-VI/27		SEA-GOOS Report	10.2	E only
I-GOOS-VI/28		Black Sea GOOS Report	10.2	E only
I-GOOS-VI/29		Indian Ocean GOOS Report	10.2	E only
I-GOOS-VI/30		Perth Office Report	10.2	E only
I-GOOS-VI/31		Rio Office Report	10.2	E only
I-GOOS-VI/32		Report of the IOC-ICES Steering Group for GOOS	10.3	E only
I-GOOS-VI/33		ICES/EuroGOOS North Sea Ecosystem Pilot Project	10.3	E only
I-GOOS-VI/34		**Regional Policy Document**	**10.3**	**E F S R**
I-GOOS-VI/35		National GOOS Contacts List	11.1	E only
I-GOOS-VI/36		**National Reports Received by the Time of the Meeting:** Australia, Canada, Cuba, France, Germany, Iceland, India, Japan, Kenya, New Zealand, Norway, Poland, Russia, Spain, Ukraine/Black Sea, USA	**11**	**E only**
I-GOOS-VI/36 B		**Report on Status of National Commitments**	**11**	**E only**
I-GOOS-VI/36 C		**National Commitments/Activities Summaries**	**11**	**E only**
I-GOOS-VI/37		Global Observing Systems Information Centre (GOSIC) Report	12.2.1	E only
I-GOOS-VI/38		The ODIN Programme	12.2.2	E only
I-GOOS-VI/38B		The ODIN Programme	12.2.2	E only
I-GOOS-VI/39		Ocean Information Technology Project	12.2.3	E only
I-GOOS-VI/40	A	Draft Report of the First Meeting of the GOOS Capacity Building (CB) Panel (Geneva, 24-26 June 2002)	13	E only
	B	**Action Plan for GOOS Capacity Building**		**E F S R**
I-GOOS-VI/41		GCOS Report on the Adequacy of the Observing System	14.1	E only
I-GOOS-VI/42		GCOS Analysis of National Responses	14.1	E only
I-GOOS-VI/43		GCOS Regional Workshops	14.1	E only
I-GOOS-VI/44		UNEP's Regional Seas Programme	14.2	not available
I-GOOS-VI/45		**Draft Memorandum of Understanding between GOOS and UNEP's Regional Seas Programme**	**14**	**not available**
I-GOOS-VI/46		Partnership for Observation of the Global Oceans (POGO)	14.3	E only
I-GOOS-VI/47		**Report of the GOOS Project Office**	**15.1**	**E F S R**
I-GOOS-VI/48		**Work Programme and Budget**	**15.2**	**E only**
I-GOOS-VI/49		Report of I-GOOS-V	18	E F S R
I-GOOS-VI/50		**Progress Against Actions for 2001-2003**	**16.1**	**E only**
I-GOOS-VI/51		US GOOS Report on Regional Activities	10.2	E only

Document Code	*Title*	*Agenda Items*	*Languages available*
I-GOOS-VI/52	GOOS-AFRICA Report	10.2	E only
I-GOOS-VI/53	Executive Summary of GSC-VI	8.1	E only

ANNEX III

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ANNEX IV

TERMS OF REFERENCE FOR THE I-GOOS BOARD
Resolution I-GOOS-VI.1

The IOC-WMO-UNEP Committee for GOOS,

Recalling

(i) that I-GOOS-V had urged that an I-GOOS Board be established to carry out I-GOOS inter-sessional work (Summary Report of the session, paragraphs 41-43),

(ii) that the IOC Assembly, at its Twenty-first Session (Paris, June-July 2001), had endorsed the recommendations made by I-GOOS-V (Summary Report of the session, paragraph 189),

Decides that the I-GOOS Board shall have the following Terms of Reference:

(i) Review and, as necessary, co-ordinate the implementation of decisions taken by the I-GOOS committee;

(ii) Review the planning of the work programmes of I-GOOS and the GSC and advise the I-GOOS and the GSC on their implementation;

(iii) Assess the resources required for the implementation of the work programmes, and suggest actions to identify and mobilize resources;

(iv) Facilitate the regular assessment of user requirements, integrating the work of existing bodies taking into consideration the analysis of benefits and costs;

(v) Provide inter-sessional guidance to GPO;

(vi) Contribute inter-sessionally to the planning processes for GOOS, and liaise with the sponsoring bodies, IOC, WMO and UNEP, as required;

Decides further that the I-GOOS Board will be composed of: the Chairperson of I-GOOS; the two Vice-Chairpersons of I-GOOS; and the Chairperson of GSC. One co-president of JCOMM will also participate in the meetings.

ANNEX V

LIST OF ACTIONS
RECOMMENDED BY THE 6TH SESSION OF THE GOOS STEERING COMMITTEE (GSC-VI)

Action 1	GPO to put all documents on the web site in rtf format, where possible, to make them readily accessible to all.
Action 2	(i) GSC Chair to draft a letter to go to appropriate agencies to stress the importance of Jason-2 for the success of GOOS; (ii) Similar letters to be drafted and sent by OOPC, by COOP, by Ralph Rayner (from the UK Marine Information Council), and by Tony Knap (operating through POGO).
Action 3	I-GOOS to consider asking Member States to report on what they are doing to assess the state of their ocean ecosystems.
Action 4	The GSC requests the Executive Secretary of the IOC to give a high priority to working with Member States to ensure that the GPO is resourced with personnel at a level adequate to the tasks required of it by Member States through I-GOOS and JCOMM, so as to meet the requirements of the GSC, I-GOOS and JCOMM, noting that given the existence of the Internet new staff do not have to work in Paris but could work part-time or full-time for GOOS in their own home offices.
Action 5	Members to provide or suggest key articles to launch new issues of the GOOS Products and Services Bulletin.
Action 6	The Review Group would need to take into consideration the recent recommendation by the JCOMM Management Committee, and its acceptance by GSC-VI (see below) that the GOOS and JCOMM CB Panels should be combined.
Action 7	The GSC requests the Executive Secretary of the IOC to make available to the GOOS CB programme at least 50% of the time of the new IOC P5 grade post in Capacity Building when the new recruit arrives in post later this year.
Action 8	GSC Chair to work with POGO to help to get more resources into POGO, and to help to broaden POGO membership.
Action 9	Tom Malone to work with COOP to write a COOP letter in support of Jason-2, and to make appropriate recommendations to the US Oceans Commission and other appropriate national bodies on the need for HF radar.
Action 10	GSC to encourage through I-GOOS-VI and the GRAs the development of pilot projects at the regional level to demonstrate the usefulness of the ecosystem-based approach to fisheries and environmental management, with a view to a report on progress at GSC-VII.
Action 11	The GSC asked I-GOOS to consider how it might encourage the development of the concept of a Federation of GRAs, using the Regional GOOS Forum as a starting point.
Action 12	GSC requests through I-GOOS-VI to the IOC Assembly that Member States take the actions, described below, to implement fully the initial global ocean climate observing system agreed at and subsequent to the OceanObs99 conference, namely: (i) to follow the recommendations and take action to increase the number of surface drifting buoys to 1250, of repeat SOOP XBT lines to 41, of geocentrically located tide gauges to 69, of ocean reference time series stations to 29, of Argo profiling floats to 3000, of VOSClim ships to at least 200, of tropical surface moorings to 119 and to carrying out the agreed repeat hydrography and carbon content and surface carbon flux survey projects, which are the key *in situ* observing elements of the agreed initial global ocean climate observing system; (ii) to participate fully in ocean data archeology efforts, in free and open exchange of contemporary data, and in support of the development and use of modern data communication, access and serving technology, which comprise the data system component of the agreed initial global ocean climate observing system; (iii) to support the Global Ocean Data Assimilation Experiment and other ocean climate analysis activities, which comprise the ocean climate product component of the agreed initial global ocean climate observing system;

	(iv) to implement the agreed ocean reference sites within the framework of the GEOS project, recognizing that they are a key link between the initial global ocean climate observing system and the development of sustained observing in support of the biogeochemical and ecosystem communities.
Action 13	Through the CEOS representative to the GSC, GSC requests the agencies involved in CEOS and IGOS-P to take steps to provide for the continuation of climate quality ocean surface altimetry, ocean color and surface vector wind missions, which are the key satellite components of the agreed initial global ocean climate observing system.
Action 14	GSC requests the OOPC to undertake the following actions: (i) to foster development of an ongoing observing system evaluation and evolution activity, in recognition that much will be learned, as the initial global ocean climate observing system provides more complete information than has been available previously, and that specific observing system activities should be adjusted in reaction to new knowledge and to new technology; (ii) to update the 1998 OOPC/CLIVAR review of global sea level to refine *in situ* requirements for climate sea level variability and change; (iii) to develop recommendations for an activity to ensure that operational flux fields will be stored and made available for comparison with each other and with high quality *in situ* observations; (iv) to carry out a review of the global surface drifting buoy programme and formulate recommendations to maximize the utility of this programme; (v) to expedite its efforts to develop a set of ocean climate indicators with associated observing system activity needs; (vi) to review the state of climate-related sea ice analysis capability, with appropriate specialist groups, and recommend any needed actions for improvement; (vii) to review the trends in subsystem development with a view to developing a 10-year development profile for each as the basis for identifying priorities for investment.
Action 15	GSC requests the OOPC and COOP to formulate a joint pilot project to make use of GODAE products and shared technology.
Action 16	GSC requests JCOMM Management Committee to take actions to identify the reasons why many *in situ* data are not being sent to the relevant international archives, and to take action wherever possible to use the resources of the larger *in situ* community to assist the nations in bringing their data to the archives. As an immediate action, it is requested that this be brought to the attention of the GLOSS group of experts.
Action 17	Members to provide Paul Mason before 7 March 2003 with any suggestions they have to improve the presentation of the ocean component of the Adequacy Report.
Action 18	GSC requested OOPC to work with the JCOMM Observations Coordination Group (OCG) to develop a mechanism for coordinating observational data requirements with implementation mechanisms.
Action 19	GSC accepted the invitation to co-sponsor the JCOMM *ad hoc* Task Team on the Development of New Products and Services, and called for membership nominations from COOP and GODAE.
Action 20	GSC agreed with the proposal from the JCOMM Management Committee to work towards the merger of the JCOMM CBCG and GOOS CB Panel; action to draw up a merger plan to be taken by JCOMM CB Coordinator and GOOS Panel chair, for MAN-III and GSC-VII.
Action 21	GSC to request JCOMM for invite the JCOMM TT on resources to support GOOS also.
Action 22	GSC agreed to the request from JCOMM to participate in the work of GOOS to develop a communications strategy, which could then also be used as the basis of a related JCOMM communications strategy, requested JCOMM to nominate one or more members to the communications working group.

Action 23	GSC agreed to co-sponsor the Ocean Products Workshop, May 2004 (no financial implications), and requested OOPC and the GOOS Regional Forum to provide representatives on the organizing committee.
Action 24	GSC requests IGOS Partners, through the CEOS representative to the GSC, to ensure adequate linkage between the requirements for remote sensing identified by the Oceans and Coastal Theme Panels.
Action 25	GPO and Eric Lindstrom to work with OOPC, COOP, JCOMM and the GRAs to carry out the rolling review of Ocean Theme by year end 2003.
Action 26	OOPC to work with International Time Series Science Team and JCOMM to develop a data and information plan.
Action 27	GSC Members to send to the GPO suggestions for the names of possible chairs for the GOSIC review by end April.
Action 28	GPO to arrange the second review of GOSIC during 2003, in concert with GCOS and GTOS.
Action 29	(i) The Working Group on Indicators to continue its work to finalize the present draft and present it to GSC-VII; (ii) GSC to aim to have a set of marine indicators ready for inclusion in UNEP's GEO-4 report; (iii) GPO and GSC Members to work together to develop a page of indicators that can be placed on the GOOS web site; (iv) Franciscus Colijn to provide Members and the GPO with copies of the recent Dutch study on marine indicators.
Action 30 (based on old action item GSC-V.31)	GPO will work closely with the ICES-IOC Steering Group on GOOS (at its next meeting in Nantes, April 2003) to see how ICES can help take forward COOP and OOPC initiatives and *vice versa*, as a prelude to consideration of the development of an Atlantic-wide multi-community approach to GOOS that would build on and complement ongoing developments involving GODAE, EuroGOOS, and US and Canadian agencies. One possible outcome may be arranging a meeting of all the different North Atlantic operational, modelling and research groups to aim at the development of a comprehensive and integrated observing system for the region.
Action 31 (based on old action item GSC-V.32)	Tom Malone will identify a COOP representative to explore with PICES the possibility of developing a joint GOOS and PICES approach to ocean observations in the North Pacific, including the possibility of establishing a regional GOOS office for the North Pacific.
Action 32	(i) The trends noted by Bert Thompson's review of national inputs need to be cross checked by the JCOMMOPS Centre; (ii) JCOMMOPS should be providing regular statistics to JCOMM and GOOS on system performance.
Action 33	GSC requests JCOMMOPs to develop a method for demonstrating the volume flow of data over time.
Action 34	Silvana Vallerga, GPO and Bert Thompson to develop a proposal for consideration at the I-GOOS-VI meeting in March 2003 for a mechanism for compiling and analyzing all national contributions to GOOS, including the data collected by GRAs, so as to be able to provide a comprehensive annual reports on the start of the observing system.
Action 35	(i) The GPO should review more cost effective way of covering the growing number of GOOS related meetings; (ii) The GPO should investigate secondment possibilities and broader base of external funding; (iii) A forecast of future secured funds should be presented to each GSC meeting; and (iv) The GSC should make strong representation to IOC on the need for continuity in the role of the head of the GPO.
Action 36	The GSC formed a small intersessional group to comprise Ralph Rayner (chair), Tony Knap, the Director GPO and other members as appropriate, to draft a Development Plan and to report back to GSC-VII.
Action 37	Merge the GOOS and JCOMM CB Panels, following the requirements and strategy noted in section 8.2, above.

Action 38	Create registers of existing capacity building efforts (including those of related programmes – organized in the context of GRAs) and of potential sources of funds for capacity building.
Action 39	The Chair of the GOOS CB Panel or his representative should report on progress and plans to I-GOOS and be part of the Regional GOOS Forum.
Action 40	The inter-sessional Communications Group should continue its work, aiming to finalize a draft communication plan (CP) by the end of May for endorsement by the GSC by e-mail. The Group should co-opt members from JCOMM (with the advice of Peter Dexter) and accept the offer of free assistance of communications specialist, Laura Nowlin. In drafting the plan the objectives and means of achieving them should be discussed with POGO to see what part they may be able to play in it, and with LOICZ and IGBP to learn from their experiences in developing a communications outreach programme. Among other things, the draft plan should (i) prioritize the present set of short term objectives; and (ii) consider the modalities for engaging organizations with money and interest (e.g. insurance or reinsurance companies). The plan should have an Appendix comprising a costed proposal for employing a communications professional to implement the strategy.
Action 41	So as to spread the word about GOOS, the Communications Working Group and the GOOS CB Panel should work with the IOI to consider how to capitalize on (i) IOI's training programmes to develop appropriate training on GOOS for policy makers; (ii) IOC's network of regional centres (25 globally); and IOI's high level contacts at the ministerial level.
Action 42	Create inter-sessional Working Group to develop GOOS inputs to JCOMM-II, and follow recommendations given in (i) through (iii) of GSC-VI 9.1 (a).
Action 43	GSC to actively participate in the JCOMM Services Coordination Group (SCG) Task Team on Development of Ocean Services, with membership modified as necessary to include a representative of GODAE and of COOP (Action required of GSC Chair, JCOMM Co-presidents, JCOMM and GOOS Secretariats, JCOMM Services Programme Area Coordinator).
Action 44	To create an inter-sessional Working Group on Strategy, chaired by Worth Nowlin and comprising also Tom Malone, Ed Harrison, Nic Flemming, Tom Trull, Paula Etala and the Director GPO, to develop Version 2.0 of the Strategic Plan for GOOS, following the recommendations and timetable laid down in 9.1 (ii) 1-8, above.
Action 45	(i) To create an intersessional Editorial Group to Update "The GOOS 1998", chaired by XNXNX and comprising Helen Yap, Jose Muelbert, Nic Flemming, Silvana Vallerga, an OOPC representative, and the Director of the GPO, following the recommendations and timetable laid down in 9.1, 1-8, above; (ii) Peter Dexter to advise on the possible availability of a Canadian consultant.
Action 46	GPO to convey the comments on the 2002 review of GOOS (GSC-VI section 9.3) to the GOOS Review Group before March 7, for consideration in the amendments to the report of the Review Group for the IOC Assembly.
Action 47	Make GOOS products and services a focus for GSC-VII in Paris in spring 2003, and arrange a comprehensive (say half day) demonstration of GOOS products and services to take place during that meeting, along with a presentation from Jean-Francois Minster, and followed by a reception particularly for French GOOS suppliers and users (inter-sessional organizing group to comprise Raph Rayner (Chair), GPO Director, Worth Nowlin, JCOMM Task Team on Products and Services, Peter Dexter, and French GOOS advisor).
Action 48	(i) Members to suggest to GSC Chair and GPO, by end March, names of potential replacements for Worth Nowlin in the area of ocean physics and climate; (ii) GPO to advise GSC Chair on names of eligible candidates still in reserve from the nominations exercise of 2002.
Action 49 (based on old action item GSC-V.11)	Members to list significant highlights of GOOS (ways in which GOOS had made a significant impact on the scientific and other user communities) from the past 5 years, for the GPO to put on the GOOS web site. Feedback needed by end May.
Action 50 (based on old action item GSC-V.12)	Indicate to GRAs that the software developed by COOP to determine the core variables to be measured for coastal seas is available from http://www.phys.ocean.dal.ca/~lukeman/COOP/.

Action 51 (based on old action item GSC-V.27)	(i) Tony Knap will prepare a power point presentation on the RAMP pilot project to be used by GRAs and others; (ii) Tom Malone will present the talk at I-GOOS-VI.
Action 52 (based on old action item GSC-V.49)	(i) GSC Chair to ask Jesse Ausubel to give a presentation at GSC-VII on the requirements of the Census of Marine Life for ocean monitoring; (ii) Tony Knap to provide advice on what other high level Foundation people might be invited to GSC-VII.
Action 53	GPO to finalize and circulate the first draft of the report of the meeting by March 7.
Action 54	(i) Tom Malone to represent GSC Chair at I-GOOS-VI; (ii) GPO to finalize executive summary of report of GSC-VI for Tom Malone by March 7.
Action 55	GPO and GSC Chair to approach Jean-François Minster with a view to holding GSC-VII and the associated demonstration of products and services on IFREMER premises during the last week in April (date to be determined quickly).
Action 56	GPO and GSC Chair to decide on the venue for GSC-VIII.

ANNEX VI

REVIEW OF THE NEEDS OF REGIONAL GOOS BODIES

At the 1st Regional GOOS Forum (Athens, 2-6 December 2002), the GOOS Regional Alliances highlighted the following various needs (Table 1). The Report of the meeting (I-GOOS-VI/21; GOOS Report 127) agreed that these topics should be brought to the attention of I-GOOS-VI, to stimulate the agencies from the industrial world to assist in meeting the needs of the less developed regions, as a means of stimulating technology transfer and capacity building initiatives on a bilateral basis.

The needs fall into six main categories: (i) infrastructure; (ii) making observations (monitoring); (iii) data and information access, management, communication and exchange; (iv) data analysis, assimilation, modelling and product development; (v) awareness raising; (vi) funding. The numbers in parentheses show where the need was identified by more than one GRA.

Table 1: **FIRST REGIONAL GOOS FORUM: REGIONAL NEEDS**

(i) Infrastructure

- Appropriate institutions and infrastructure ;
- Supply and employment of skilled personnel (2);
- Appropriate coordinating mechanism (including dedicated Secretariat) (2);
- More enabling research, and research facilities;
- Training facilities;
- Improved communications infrastructure (bandwidth – and even E-mail in some areas);
- Mechanism to transition research to operations.

(ii) Making Observations (Monitoring)

- Much increased monitoring (to eliminate the many data gaps) (3);
- Aid and training in the deployment, operation and maintenance of observing equipment (including ship time and on-board training (3);
- Improvements and increases in technological systems for observations (including, e.g., tide gauge network for Africa) (3);
- Inventories of current situation.

(iii) Data and Information Access, Management, Communication and Exchange

- Integrated data management system for rapid access to diverse data from disparate sources;
- Improved data exchange at national level (full potential is untapped) (4), and between countries (2), including removal of barriers to the exchange of certain data (e.g. bathymetric and pollution);
- The means for accessing, processing, analysis and storage of satellite data (2);
- Timely processing of real-time data, to increase the value of exchange;
- Communication facilities for real-time exchange of data; training in data transmission (3);
- Creation of websites accessible in a common international language;
- Improved archiving, databases and QA/QC, and training in QA/QC (2);
- Common standards of measurement or accuracy;
- Training in data and information management (2).

(iv) Data Analysis, Assimilation, Modelling and Product Development

- Training and increase of personnel in numerical modelling and data assimilation (3);
- Access to appropriate computing facilities for data processing and modelling (2);
- Training in merging, analyzing and transforming data into sophisticated data products (2).

(v) Awareness Raising

- Bring together the wide and diverse stakeholder community;
- Raise awareness of and get support from decision makers, managers, scientists and industry, by demonstrations of usefulness of the tools for national development (through products relevant to users' needs) (7);
- Recognize and work to overcome the disparate missions of different national ocean agencies to create consensus, co-operation and commitment (from chaos to order) (3);
- Gain special commitment of the scientific community, and of meteorological agencies;
- Capitalize on legal requirement for industry to show its 'green' credentials (environmental compliance) and to demonstrate it is observing a 'duty of care' (which translates into funding) (note usefulness of industry associations);
- Gain commitment by government (national political will) noting governments' obligations under global Conventions (6);
- Gain regional consensus between nations (build on regional instruments, like Regional Seas Conventions and Action Plans etc);
- Address the legal impediments to timely observations in EEZs, and to data exchange (2).

(vi) Funding

- Gain higher levels of investment (4).

ANNEX VII

GOOS REGIONAL POLICY

1. PURPOSE

Establishing and improving the GOOS are critically dependent on the coordinated development of GOOS Regional Alliances (GRAs) that contribute to and benefit from the global system. GRAs are created to facilitate sustained ocean monitoring to meet regional and national priorities. They require interagency collaboration and an internationally accepted policy. The activity and cooperation of GRAs is especially important to the development of the coastal module of GOOS.

2. QUALIFICATIONS

2.1 GRAs are formed by agreement between participating countries, national organizations, and/or international bodies (Regional monitoring networks, Regional Fishery Bodies, Regional Seas Conventions, etc.). Membership should be chosen to best serve the data and information needs of organizations that use, depend on, or are responsible for the management of the marine environment and its resources in the region.

2.2 To be recognized as a part of the GOOS, a GRA must conform to the GOOS principles, policies and practices that are established and endorsed inter-governmentally by the IOC, WMO or UNEP from time to time.

2.3 To the extent that the geographic range and activities of a GRA overlap with those of other GRAs, the GRAs involved must establish agreements to ensure effective use of resources to the benefit of all.

2.4 Each GRA is expected to benefit from and contribute to the activities of the GOOS Regional Forum established by the Intergovernmental Committee for GOOS (I-GOOS).

3. APPROVAL

3.1 The compliance of the activity of an organization requesting recognition as GRA with the GOOS principles must be reviewed by the GOOS Steering Committee and endorsed by the Intergovernmental Committee for GOOS (I-GOOS), upon evaluation of issues of inter-governmental cooperation, sponsorship or endorsement. The I-GOOS will inform the executive body of the GRA concerned about the evaluation. Where improvements, changes or actions are recommended to secure recognition, these shall be negotiated through the GOOS Project Office. After its endorsement by the I-GOOS, the case for each GRA will be submitted for the approval of the General Assembly or the Executive Council of the IOC.

3.2 Proposals to be recognized as a GRA must include the following:

- Evidence that a management structure is in place that can deliver an integrated and sustained system by linking, enhancing and supplementing existing infrastructure and expertise in the region.

- Provision of an acceptable business plan that has been endorsed by stakeholders (data providers and users) from the region and describes the procedures by which the observing system will be established, developed, and sustained. This must include procedures for quality assurance, conformance to internationally accepted standards and protocols for measurements, data management, and communications.

4. ACCOUNTABILITY

4.1 To ensure that there is a single forum where GOOS activities can be considered in their entirety, all recognized GRAs are expected to: (i) be active members of the GOOS Regional Forum, (ii) be represented at meetings of the I-GOOS, (iii) provide periodic reports on their activities to I-GOOS. Reports should include among other things (a) analyses of the extent to which GOOS Principles have been implemented, and (b) information about the provision of data and information in forms and at rates required by user groups, about data quality, and about the continuity of data streams.

4.2 A GRA may be dropped from the GOOS based on the recommendation of I-GOOS and approval by the General Assembly or Executive Council of the IOC.

ANNEX VIII

ACTION PLAN FOR CAPACITY BUILDING
ACTION PLAN (version 1.3), Phase I, Lifecycle 2002-2004

Reference Documents

1. GOOS Report 69
2. GOOS Report 106
3. First GOOS Capacity Building Meeting Report

CONTEXT

Mission Statement:

> *"To develop the capacity building needed to ensure the growth, development, sustenance and evolution of GOOS worldwide"*

Long-term objective:

> *"Build a solid foundation for global operational oceanography to ensure the complete development of GOOS by 2008-2010"*

This requires:

- Awareness raising;
- Education and training;
- National and regional support structures;
- Networks and Partnerships;
- Broad infrastructure;
- Communication;
- Mutual assistance.

In order to:

- Develop and maintain the scientific capacity required for GOOS;
- Raise understanding and awareness of value of observations and their benefits;
- Facilitate the creation of baseline networks in critical areas;
- Raise abilities to participate in and benefit from GOOS.

We already have:

- Statement of Principles (GOOS 69);
- Implementation Strategy (GOOS 106);
- Capacity Building Panel;
- Shared responsibility with the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) Capacity Building Programme Area Coordination Group (CBCG);
- Existing capacity building activities (e.g., International Ocean Data Exchange (IODE), UNESCO Bilko project);
- Existing Partnerships (e.g., POGO, IGOS Partners);
- GOOS Project Office staff in Paris, Bangkok, Perth, Rio and Cartagena with part time responsibilities for CB;
- Regional GOOS Alliance Secretariats with similar part time responsibilities (e.g. MedGOOS);
- Approximately $250,000 annually in programme costs in support of GOOS-CB.

THE ACTION PLAN

The Action Plan details the short to medium term objectives, the actions and the timeframes required to realize selected high-priority objectives. We see Regional GOOS Alliances as essential for implementation.

Therefore it is suggested that the Action Plan is used as a template by national and regional GOOS bodies and GOOS technical panels. We also see Partnerships being critical to meeting the objectives. The Action Plan builds on existing initiatives and is expected to evolve as targets and priorities change; for this reason this Action Plan is considered to represent phase I of the GOOS capacity building programme.

GOOS Capacity Building Actions and Activities

The following are considered key action areas (Vertical Pillars) of GOOS capacity building:

- Infrastructure;
- Remote sensing;
- *In situ* observations;
- Ocean models and forecasting;
- Data and information management exchange and delivery.

The following are seen as key horizontal crosscutting activities:

- Multidisciplinary oceanographic training and education;
- Calibration and standards;
- Paying attention to cultural and language diversity;
- Outreach and raising awareness including schools and policymakers;
- Development of networks;
- Communication and liaison;
- Fundraising;
- Documentation including manuals and handbooks (removing language barriers);
- Technology transfer (including software and hardware);
- Regional activity centers;
- Regional workshops.

Conceptual framework

GOOS will develop at the ocean basin to global scale, with the implementation and growth of projects like the Global Ocean Data Assimilation Experiment (GODAE), the Argo profiling float programme, the Ship of Opportunity Programme (SOOP), the global distribution of surface drifting floats, equatorial buoy arrays, and ocean surveillance from satellites. GOOS will also develop at the regional level through GOOS Regional Alliances of countries with a common interest in a particular water body, like the Caribbean, or the Mediterranean. And GOOS will develop at the national level through the exchange of information collected by parts of national observing systems. Capacity building is needed to improve performance at all three levels, and to enable developing countries in particular to participate in, benefit from, and contribute to GOOS.

Specific Actions Required to Implement Phase I

1. Create and sustain a capacity building staff position within the IOC to coordinate capacity building activities.
2. Create an information system to avoid duplication of capacity building initiatives of relevance to GOOS (e.g., calendar of activities).
3. Improve the data and information management networks and exchange in support of GOOS by strengthening collaboration with IODE's Ocean Data Information Network (ODIN) and OceanTeacher to make effective use of the experience gained and groundwork done by IODE.
4. Develop a web portal (gateway to internet based information sources) to provide a comprehensive information resource of ocean activities relevant to GOOS, making use of IODE's dynamic content management system and Ocean Portal.
5. Create a set of "Start up packs" following the example provided by the IODE Resource Kit and focusing on operational oceanography.
6. In consultation with JCOMM, WMO and CEOS, develop a plan to guide capacity building in remote sensing.

7. Improve knowledge of, and training in the use of, oceanographic remote sensing in support of the development of GOOS data products and services, by capitalizing on the UNESCO Bilko project (e.g., to create introductory and regional distance learning modules).
8. In consultation with JCOMM, improve knowledge and training in the use of oceanographic *in situ* methods and data in support of the development of GOOS data products and services, for instance by creating appropriate distance learning modules (e.g., using netCDF and ncview).
9. In consultation with JCOMM and WMO, develop a plan for CB in ocean modelling and forecasting including the development of a pool of freely available numerical models.
10. In cooperation with JCOMM and other partners, explore the possibility of an infrastructure-sharing programme to facilitate the exchange of technology, equipment and services between countries (e.g., a Voluntary Cooperation Program (VCP).
11. Providing alternative mechanisms to the Internet for access to all GOOS materials (e.g., CD's).
12. In association with IOI, assemble educational material to explain the benefits and applications of global observations to students. This would use, for example, games-based learning packages (targeted at schoolchildren) and Argo profile data as in the SEREAD project for high-school students.
13. Provide information about educational materials and initiatives currently available from national and international agencies (Met Offices, Space agencies, Navies etc.) for graduate and postgraduate students, and technical staff.
14. In cooperation with I-GOOS and the JCOMM Task Team on Resources, acquire the necessary resources to implement Phase I.

The GOOS Capacity Building Panel and the GOOS Project Office in consultation with the GSC, I-GOOS and relevant partners, will devise precise plans, schedules and, costs for implementing each of these specific actions. Mini-proposals will be required for each specific action before end January 2003.

GOOS Capacity Building Program Evaluation

The programme will be evaluated as follows:

1. Proposal evaluation: see Implementation Plan Annex IV, GOOS Report 106.
2. Project evaluation on completion (see CB Principles pages 7 and 8, GOOS Report 69)
3. Programme evaluation and review (see CB Principles pages 7 and 8, GOOS Report 69)

Appropriate parts of the evaluation will be made in association with JCOMM.

ANNEX IX

ACTION SHEET ON RECOMMENDATIONS AND RESOLUTIONS OF I-GOOS-VI (PARIS, 10-14 MARCH 2003)

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
3.0 para 20	ToRs of I-GOOS Board	Recommend that the IOC Assembly endorse the ToRs and Membership of the I-GOOS Board as proposed in Resolution I-GOOS-VI.1.	I-GOOS Chair	IOC 22nd Assembly
5.0 para 29-39	Modifications to the draft report of the GOOS Review Group	Suggest to the GOOS Review Group the need to: (i) Identify the critical importance of GRAs; the need for I-GOOS to work with GRAs on regional development of GOOS; and the need for I-GOOS to approve GRAs as GOOS components. (ii) Emphasize the need for development of coastal GOOS; note the possible need for a mechanism parallel to JCOMM for coastal GOOS. (iii) Continue the present frequency of I-GOOS meetings. (iv) Note the need to examine the frequency of meetings of subsidiary bodies. (v) Note the request to avoid confusion on the ownership of GOOS substituting the "Steering" with "Scientific" in the S of GCS.	GPO	Immediately
5.0 para 34	GRA Groupings	Consider over time how it might encourage the development of the concept of a Federation of GRAs or a network of GRAs, using the Regional GOOS Forum as a starting point.	I-GOOS	By I-GOOS-VII
5.0 para 38	Frequency of Meetings of Subsidiary Bodies	Consider the Frequency of Meetings of Subsidiary Bodies.	I-GOOS Board	Before I-GOOS-VII
5.0 para 39	ToRs of I-GOOS, GSC and GPO	Recommend the GOOS Sponsors (including IOC) work to modify the ToRs of I-GOOS, GSC and GPO, following the advice of the Review Group.	(i) I-GOOS Chair (ii) Sponsors	IOC 22nd Assembly Before I-GOOS-VI
6.0 para 41	Resources Working Group	Hold meetings as appropriate of the Resources Working Group.	Resources Working Group	With immediate effect

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
7.0 para 45	I-GOOS and ABE-LOS	Convey to ABE-LOS/IOC the interests of the Committee regarding the collection and management of oceanographic data in EEZs.	I-GOOS Chair	3rd Meeting of ABE-LOS/IOC
7.0 para 45	I-GOOS and ABE-LOS	Recommend to the IOC Assembly that ABE-LOS/IOC provides advice on the legal framework applicable to the collection and management of oceanographic data in EEZs, while I-GOOS offers advice on the technical and scientific context.	I-GOOS Chair	IOC 22nd Assembly
8.1 para 60	State of ocean ecosystems	Recommend that IOC ask Member States to report on what they are doing to assess the state of their ocean ecosystems in response to the requirements of the WSSD.	I-GOOS Chair	IOC 22nd Assembly
8.1 para 61	Pilot Projects	Encourage GRAs to develop pilot projects to demonstrate the usefulness of the ecosystem-based approach to fisheries and environmental management.	GPO	As soon as possible
8.1 para 62	Development Plan	I-GOOS Board should be represented on the GSC inter-sessional group to draft a Development Plan and to report back to GSC-VII and I-GOOS VII.	I-GOOS Board	As soon as possible
8.1 para 63	GOOS Strategy	I-GOOS Board should be involved in the inter-sessional Working Group on Strategy.	I-GOOS Board	With immediate effect
8.2 para 76	Implementing fully the initial global ocean climate observing system	Bring to the attention of Member States through the IOC Assembly, the need for the following actions to implement fully the initial global ocean climate observing system: (i) to increase the number of surface drifting buoys to 1250, of repeat SOOP XBT lines to 41, of geocentrically located tide gauges to 69, of ocean reference time series stations to 29, of Argo profiling floats to 3000, of VOSClim ships to at least 200, of tropical surface moorings to 119 and to carrying out the agreed repeat hydrography and carbon content and surface carbon flux survey projects, which are the key *in situ* observing elements of the agreed initial global ocean climate observing system. (ii) to participate fully in ocean data archeology efforts, in free and open exchange of contemporary data, and in support of the development and use of modern data communication, access and serving technology, which comprise the data system component of the agreed initial global ocean climate observing system. (iii) to support the Global Ocean Data Assimilation Experiment and other ocean climate analysis activities, which comprise the ocean climate product component of the agreed initial global ocean climate observing system.	I-GOOS Chair	IOC 22nd Assembly

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
		(iv) to implement the agreed ocean reference sites within the framework of the GEOS project, recognizing that they are a key link between the initial global ocean climate observing system and the development of sustained observing in support of the biogeochemical and ecosystem communities.		
8.3 para 84	COOP	Modify COOP Plan to reflect I-GOOS' position that there currently is not a need for a federation of GRAs.	COOP/GPO	With immediate effect
9.1 para 91	GLOSS	Recommend to the IOC Assembly that Member States should upgrade all GLOSS designated stations for real-time data delivery by 2004, and provide their GLOSS data as required by the GLOSS Implementation Plan.	I-GOOS Chair	IOC 22nd Assembly
9.2 para 93	Brussels Conference	Recommend that the IOC Assembly urge Member States to support and participate in the Brussels 150 year conference to honour the pioneering work of Lt. Maury and examine the future of operational oceanography.	I-GOOS Chair	IOC 22nd Assembly
9.2 para 94	Effectiveness of JCOMM	Recommend that the IOC Assembly urge Member States to encourage collaboration between meteorological and oceanographic organizations at the national level so as to ensure the effectiveness of JCOMM.	I-GOOS Chair	IOC 22nd Assembly
9.2 para 97	Preparing for JCOMM-II	Request the GSC "inter-sessional Working Group to develop GOOS inputs to JCOMM-II" to report on that topic to the I-GOOS Board and take account of the latter's suggestions as necessary.	I-GOOS Chair	With immediate effect
9.3 para 101	Jason-2 Mission	Recommend that the IOC Assembly urge Member States to provide support for the JASON 2 mission.	I-GOOS	IOC 22nd Assembly
9.4.1 para 115	Argo Information Centre (AIC)	Recommend that the IOC Assembly invite Member States to contribute to the AIC trust fund to share the burden with those already making commitments.	I-GOOS Chair	IOC 22nd Assembly
9.4.1 para 117	Argo Information Centre	Recommend that the Argo Information Centre (i) make easily available via its web site the list of National Focal Points and information about how to submit changes to the list, and (ii) facilitate communication about Argo float deployments and positions.	Argo Information Centre	With immediate effect

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
9.4.2 paras 126-127	Maintaining the PIRATA Array	(i) Request PIRATA Steering Group to consider cost-effective ways and means of maintaining the PIRATA array. (ii) Request the Atlantic Observations Working Group to pay careful attention to the issue of cost-effective solutions in terms of ship support.	I-GOOS Chair I-GOOS Chair	With immediate effect With immediate effect
9.4.2 para 128	PIRATA	Recommend that the IOC Assembly urge Member State States to provide resources to support PIRATA implementation.	I-GOOS Board	IOC 22nd Assembly
9.4.3 para 131	WIOMAP	Recommend that the IOC Assembly urge Member States to provide resources to support WIOMAP implementation.	I-GOOS Chair	IOC 22nd Assembly
10.1 para 132 and 10.2 para 152 (3)	Meeting Regional Needs	Recommend that the IOC Assembly urge developed Member States to help developing states meet the regional needs for development expressed by the GRAs at the 1st regional GOOS Forum.	I-GOOS Chair	IOC 22nd Assembly
10.1 para 133 and 10.2 para 152 (7)	Regional Forum	Develop the venue, timing, agenda and priorities for the next Regional GOOS Forum, in the Pacific, with the aid of SOPAC, the Perth Office, the WESTPAC Office, Pacific Islands GOOS and the GPO.	I-GOOS Board and GPO	With Immediate effect
10.2 para 136	NEAR-GOOS	Recommend that the IOC Assembly urge Member States of NEAR-GOOS to make it more effective by exchanging more data and by adding parameters to fill information gaps.	I-GOOS Chair	IOC 22nd Assembly
10.2 para 138	GOOS-AFRICA	Continue collaboration between GOOS and IODE in Africa.	GOOS-AFRICA and IODE Secretariats	With immediate effect
10.2 para 140	IOCARIBE-GOOS	Work with UNEP to determine what products the Regional Seas Programme requires and what GOOS may be able to deliver that could also be useful.	IOCARIBE-GOOS	With immediate effect
10.2 para 149	GOOS in the South Atlantic	Rio Office to focus on strengthening the relations between Brazil, Uruguay and Argentina for the eventual development of a GOOS regional alliance.	Rio GOOS Office	With immediate effect
10.2 para 152 (6)	Links to Regional Subsidiary Bodies of the IOC	Recommend to the IOC Assembly that full use be made of the existing regional subsidiary bodies of the IOC in building GRAs.	I-GOOS Chair	IOC 22nd Assembly
10.3 para 154	Regional Policy	Recommend that the IOC Assembly endorse the GOOS Regional Policy.	I-GOOS Chair	IOC 22nd Assembly
10.3 para 154	Approval of GRAs	Recommend that the IOC Assembly accept and approve the following GRAs as members of the GOOS family: EuroGOOS, MedGOOS, GOOS-AFRICA, PI-GOOS, IOGOOS and US-GOOS; noting that Black Sea GOOS, IOCARIBE-GOOS, and NEAR-GOOS have already been formally approved.	I-GOOS Chair	IOC 22nd Assembly

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
11.2 para 157	National Reporting	Recommend that the IOC Assembly urge Member States to keep the GPO abreast of their developments by submitting regular national reports using the template for national reporting.	I-GOOS Chair	IOC 22nd Assembly
11.3 para 160	GLOSS	Special efforts should be made by GLOSS to determine whether sites can be upgraded to meet GODAE or future Ocean Climate requirements and to identify impediments to doing so if they cannot be upgraded.	GPO	GLOSS-VIII meeting
11.3 para 163	National Contributions to GOOS	Develop a mechanism for compiling and analyzing all national contributions to GOOS, including the data collected by GRAs, so as to be able to provide a comprehensive annual reports on the status of the observing system.	I-GOOS Board	As soon as possible
11.3 para 164	National Reporting and GOSIC	Form an inter-sessional working group to review the future activities and funding, including personnel and facilities of the assessment of national contributions, and GOSIC activities.	I-GOOS Chair and GPO	With immediate effect
12.1 para 165	Data Policy	Recommend that the IOC Assembly urge Member States to support the publication of a data policy.	I-GOOS Chair	IOC 22nd Assembly
12.2.1 para 168	GOSIC	Bring to the attention of the IOC Assembly the need for a Member State to accept operational responsibility for GOSIC.	I-GOOS Chair	IOC 22nd Assembly
12.2.2 paras 180-184	IODE	(i) IODE should preserve also its unique role and legacy as an important IOC Programme; (ii) Welcoming the proposed merger of the IODE GE-TADE and JCOMM ETDMP, I-GOOS called for further streamlining and optimization of GOOS, JCOMM and IODE subsidiary bodies in the field of ocean data and information management; (iii) IODE should make efforts to include chemical data, including pollution data, as these are of great importance to the coastal module of GOOS; (iv) IODE should include in the Ocean Teacher system courses to train scientists on the importance of data and information management.	IODE IODE, JCOMM, GSC IODE IODE	With immediate effect Before I-GOOS-VII With immediate effect With immediate effect
12.2.3 para 188	Ocean Information Technology Project	Recommend that the IOC Assembly urge Member States to resource the development of the Ocean Information Technology Project.	I-GOOS Chair	IOC 22nd Assembly
13.1 para 190	GOOS Capacity Building Panel	Merge the activities of the GOOS and JCOMM CB Panels, where appropriate.	GSC and JCOMM	With immediate effect

Ref.	Subject	Action/Recommendation proposed	Responsible	Target Date
13.1 para 191	GOOS Capacity Building Panel	The Chair of the GOOS CB Panel or his representative should report on progress and plans to I-GOOS and be part of the Regional GOOS Forum.	GOOS CB Panel Chair and I-GOOS Chair	With immediate effect
13.3 para 199	Data and Information Management	Recommend that the IOC Assembly urge Member States to provide university level training courses in data and information management.	I-GOOS Chair	IOC 22nd Assembly
15.1 para 218	GPO	Recommend that the IOC maintain the JCOMM post currently provided by the UNESCO Young Professional Programme.	I-GOOS Chair	IOC 22nd Assembly
15.2 para 226 & 227, and Draft Resolution to IOC Assembly	GPO Management	Recommend to the IOC Assembly that the Executive Secretary IOC: (i) Review more cost effective ways of covering the growing number of GOOS related meetings; (ii) Investigate secondment possibilities, including "virtual secondments"; (iii) Expand extrabudgetary funding; (iv) Present a forecast of future secured funds to each I-GOOS meeting; and (v) Ensurecontinuity in the role of the Director of the GPO.	Executive Secretary IOC	IOC 22nd Assembly
15.2 para 228	Capacity Building	Recommend that the IOC Assembly request the Executive Secretary of the IOC to make available to the GOOS Capacity Building programme an appropriate proportion of the time of the new IOC P5 grade post in Capacity Building when the new recruit arrives in post later this year.	I-GOOS Chair	IOC 22nd Assembly
15.3 para 232	Communications Strategy	Involve I-GOOS Board through consultation in the work of the GSC and JCOMM to develop a communications strategy.	I-GOOS Board	With immediate effect
15.3 para 233	Update to "The GOOS 1998"	I-GOOS Chair should be a member of the intersessional Editorial Group to Update "The GOOS 1998"	I-GOOS Chair	With immediate effect
18.0 para 240	Draft Resolution	Recommend that the IOC Assembly endorse the Draft Resolution for the IOC Assembly accepting the Recommendations and Resolutions of this Report.	I-GOOS Chair	IOC 22nd Assembly

ANNEX X

DRAFT RESOLUTION FOR THE 22nd IOC ASSEMBLY ON I-GOOS

Submitted by the Intergovernmental Committee for GOOS (I-GOOS)

Sixth Session of the IOC Intergovernmental Committee for the Global Ocean Observing System (GOOS)

The Intergovernmental Oceanographic Commission,

Having considered the Executive Summary and Report of the Sixth Session of the Intergovernmental Committee for GOOS (I-GOOS-VI);

Taking into account the Report of the GOOS Review Group on the Structure, Mandate and *Modus Operandi* of GOOS;

Decides to accept the Report and the Recommendations and Resolutions embedded therein.

Instructs the Executive Secretary of the IOC

(i) to give high priority to appropriate resourcing of the staff of the GPO, with personnel at a level adequate to the tasks required of it by Member States, noting that staff could be made available through "virtual secondments" (hence working in their own offices, rather than in Paris);

(ii) to give high priority to ensuring continuity in the post of Director of the GPO;

(iii) to make available to the GOOS capacity building programme an appropriate proportion of the time of the new IOC P5 grade post in TEMA capacity building;

(iv) to review more cost effective ways of covering the growing number of meetings related to GOOS and JCOMM; and

(v) to report about his findings back to the 37th session of the IOC Executive Council.

Funding Implications:

(i) Maintenance of at least the current level Regular Programme funding of the GOOS Project Office, with an appropriate increase if the UNESCO Regular Programme budget increases;

(ii) Enhancement of the extrabudgetary funding for the international coordination activities of the GPO;

(iii) The addition of a Regular Programme post in the GPO to ensure efficient and effective management of the IOC's commitments to JCOMM;

ANNEX XI

LIST OF ACRONYMS

AUV	Autonomous Underwater Vehicule
CARICOMP	Caribbean Coastal Marine Productivity
CEOS	Committee on Earth Observing Satellites
CERFACS	Centre Européen de Recherche et de Formation Avancée, Calcul Scientifique
C-GOOS	Coastal GOOS
CLIVAR	The Programme on the Variability of the Coupled Ocean-Atmosphere System and Climate Prediction (WCRP)
CMM	Commission on Marine Meteorology
CNES	Centre National d'Etudes Spatiales
CNRS	Centre National pour la Recherche Scientifique CPR
COP-4	4th Conference of the Parties
CPPS	Permanent Commission for the South Pacific
CPR	Continuous Plankton Recorder
CSIRO	Commonwealth Scientific and Industrial Research Organization
DBCP	Drifting Buoy Co-operation Pane l
DIMP	Data Information Management Panel
DIMS	Data Information Management System
EC	European Commission
EEZ	Exclusive Economic Zone
ENSO	El Ñiño and the Southern Oscillation (USA)
ESODA	European Shelf Seas Data Assimilation and Forecast Experiment
EU	European Union
EuroGOOS	European Programme for the Global Ocean Observing System
FAO	Food and Agricultural Organization of the United Nations
FCCC	Framework Convention on Climate Change
FGGE	First GARP (Global Atmospheric Research Programme) Global Experiment
FOAM	Forecast Ocean Atmosphere Model
G3OS	GCOS/GOOS/GTOS
GCOS	Global Climate Observing System (WMO-ICSU-IOC-UNEP)
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
GESAMP	IMO-FAO-UNESCO-WMO-WHO-IAEA-UN-UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GIWA	Global International Waters Assessment
GLOBEC	Globec Ocean Ecosystems Dynamics
GLOSS	Global Sea-Level Observing System (IOC)
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System (IOC/WMO)
GOOS-IOS	GOOS Initial Observing System
GOSSP	Joint GOOS-GCOS-GTOS Space Panel
GPA	Global Plan of Action
GPO	GOOS Project Office
GSC	GOOS Steering Committee
GTOS	Global Terrestorial Observing System
GTS	Global Telecommunication System (WMO)
GTSPP	Global Temperature and Salinity Profile Programme
HOTO	Health of the Ocean
IAEA	International Atomic Energy Agency
IAPSO	International Association for the Physical Sciences of the Ocean
ICES	International Council for the Exploration of the Sea
ICMAM	Integrated Coastal and Marine Area Management
ICSU	International Council for Science
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer

IGBP	International Geosphere-Biosphere Programme
IGFA	International Group of Funding Agencies
I-GOOS	IOC-WMO-UNEP Committee for the Global Ocean Observing System
IGOS	Integrated Global Observing Strategy
IGOSS	Integrated Global Ocean Services System
IIAG	Interim Implementation Advisory Group
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCEA	IOC for Eastern Atlantic
IOCINCWIO	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean
IODE	International Oceanographic Data and Information Exchange (IOC)
IPCC	Intergovernmental Panel on Climate Change
IRD	Institut de Recherche pour le Développement (formely ORSTOM)
IUCN	International Union for the Conservation of Nature and Natural Resources - the World Conservation Union
J-COMM	Joint IOC-WMO-Technical Commission on Oceanography and Marine Meteorology
J-DIMP	Joint GOOS-GCOS-GTOS Data and Information Panel
JGOFS	Joint Global Ocean Flux Study (SCOR-IOC)
J-GOOS	Joint GOOS Scientific and Technical Committee (IOC-WMO-ICSU)
LEGOS	Laboratoire des Ecoulements Géophysiques et d'Océanographie Spatiale
LME	Large Marine Ecosystem
LMR	Living Marine Resources
LODYC	Laboratoire d'Océanographie Dynamique et de Climatologie
LOICZ	Land-Ocean Interactions in the Coastal Zone (IGBP)
MAMA	Mediterranean network to Assess and upgrade the Monitoring and forecasting Activity in the basin
MAST	Marine Science and Technology
MAWS	Marine Automatic Weather Station
MEDAR	Mediterranean Data Archaeology and Rescue
MedGOOS	Mediterranean GOOS
MFSPP	Mediterranean Forecasting System Pilot Project
MFSTEP	Mediterranean Forecasting System Toward Environmental Prediction
MoU	Memorandum of Understanding
NAO	North Atlantic Oscillation
NASA	National Aeronautics and Space Administration (USA)
NEARGOOS	North-East Asian Regional GOOS
NGCC	National GOOS Co-ordinating Committee
NOAA	National Oceanic and Atmospheric Administration (USA)
NODC	National Ocean Data Centre
NOWPAP	Northwest Pacific Action Plan
ODINAFRICA	Ocean Data and Information (Africa)
OOIS	Ocean Observation and Information Service
OOPC	Ocean Observation Panel for Climate
OOS	Ocean Observation systems
OOSDP	Ocean Observing System Development Panel (JSC/WCRP)
ORZ	Ocean Regulation Zone
OSLNR	Ocean Science and Non-Living Resources
OSLR	Ocean Science in Relation to Living Resources (IOC-FAO)
PACSICOM	Pan African Conference on Sustainable Integrated Coastal Management
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
PMEL	Pacific Marine Environmental Laboratory
POGO	Partnership for Observations of the Global Ocean
RAMP	Rapid Assessment of Marine Pollution
SAR	Synthetic Aperture Radar
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Climate Changes and the Ocean
SEACAMP	South East Asia Centre for Atmospheric and Marine Prediction
SHOM	Service Hydrographique de la Marine (French Navy)
SOA	State Oceanic Administration
SOOP	Ship-of-Opportunity Programme

SOPAC	South Pacific Applied Geoscience Commission
SPREP	South Pacific Regional Environment Programme
SSC	Strategic Sub-Committee
SST	Sea-Surface Temperature
TAO	Tropical Atmosphere Ocean Array
TEMA	Training, Education and Mutual Assistance in Marine Sciences (IOC)
TOGA	Tropical Ocean and Global Atmosphere programme (IOC/WMO/ICSU)
ToRs	Terms of Reference
UKMO	UK Meteorological Office
UNCED	1992 United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
VOS	Voluntary Observing System
WCRP	World Climate Research Programme (WMO/ICSU/IOC)
WESTPAC	IOC Sub-Commission for the Western Pacific
WIOMAP	Western Indian Ocean Marine Applications Project
WIPO	World Intellectual Property Organization
WMO	World Meteorological Organization of the United Nations
WOCE	World Ocean Circulation Experiment (IOC/WMO/ICSU)
WWW	World Weather Watch
XBT	Expendable BathyThermograph