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Reports of Governing and Major Subsidiary Bodies

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

Fifth Session
28 – 30 June 2001
Paris, France

**IOC-WMO-UNEP-ICSU Committee
for the Global Ocean Observing System
(I-GOOS-V)**

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ABSTRACT

The Intergovernmental Committee for GOOS met in Paris from 28-30 June, 2001. It reviewed the structure, mandates and *modus operandi* of GOOS, and the state of GOOS development. It agreed that regional development of GOOS should be a top priority, along with increased visibility of GOOS by governments, and promotion of GOOS to governments by national “GOOS Focal Points”. It agreed to create a new formal management structure for I-GOOS, comprising an I-GOOS Board or Bureau, and a set of *ad hoc* Intersessional Working Groups to enable I-GOOS to carry out its business. It agreed to hold a review of GOOS focusing on the structure, mandates and *modus operandi*, during 2002, with the object of reporting to the 22nd IOC Assembly in 2003. It agreed to hold a Regional GOOS Forum every second year between the biennial I-GOOS meetings. Ms Silvana Vallerga (Italy) was elected chairperson, and Rodrigo Nuñez (Chile) and Ms Janice Trotte (Brazil) were elected co-chairpersons.

* Translated into French, Spanish and Russian. For reasons of budgetary constraints, Annexes III to VII remain untranslated.

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1. OPENING

- 1 Dr. A McEwan, Chairman I-GOOS, called the session to order at 09.30 on Thursday, 28 June 2001. He welcomed all attendees, and noted the difficulties caused by having to sandwich this meeting between JCOMM-I in Iceland and the 21st IOC General Assembly, which may in some cases have prevented representation.
- 2 He called upon the representatives of the sponsoring organizations to speak briefly on behalf of their organizations, noting that WMO would not be able to do this because their representatives were still in Iceland finalizing JCOMM-I. Mr. Ellik Adler, of UNEP, extended greetings and wishes for the success of the meeting from Mr. Klaus Topfer, Director-General of UNEP, and Mr. Jorge Illueca, Director UNEP's Conventions Branch. UNEP sees many opportunities for developing a close relationship with the work of the Coastal Ocean Observations Panel (COOP), and with the work of the regional GOOS bodies, in implementing the requirements of the Regional Seas Conventions and Action Plans.
- 3 Mr. Patricio Bernal, Executive Secretary of the IOC, welcomed participants to UNESCO and the IOC. He noted that I-GOOS had an important part to play in meeting the challenges of implementation, which would principally take place through the individual and concerted actions of Member States. Current planning and implementation have to take into account the realities of the evolving international scene, by means of appropriate partnerships. The structure set up to provide this implementation has provided an effective mechanism for engaging governments and regions that has been flexible enough to allow them to develop their contribution as they needed, while following GOOS Principles.
- 4 Mr. Bernal reminded participants that although many of the operational oceanographic observations at the local scale were carried out by the private sector, the ability of that sector to deal with local processes effectively required observations from a much larger regional and even global scale system that no private sector group could afford. A truly global observing system was required to improve the efficiency of local observing systems so as to meet local needs for both the public good and for the private sector. The creation of one universal GOOS demanded coordination by an intergovernmental organization; it is beyond the capacities of international scientific organizations. I-GOOS is that body, and I-GOOS is needed. With the help of I-GOOS, the GOOS Steering Committee (GSC), and the implementing agencies of Member States, we have seen some great achievements in the past 5 years. We will likely see yet more gains in future, with the implementation of Argo, which will change the face of oceanography forever.
- 5 I-GOOS is an important nodal point in the development of GOOS because it provides a mechanism through which to work with Member States to achieve permanence and to find the resources from public funds needed to sustain the system. To convince governments of the benefits of investment in GOOS, I-GOOS needs to create a portfolio of examples of the economic benefits that will accrue from wise investment. I-GOOS should do this in association with the private sector, particularly those parts that would benefit from the use of secondary or tertiary level products, like weather and climate forecasts. I-GOOS should also take the responsibility of interacting with governments, to consolidate what has been achieved thus far. Much was already being achieved along these lines in the regions, by associations of agencies of governments.
- 6 The Chairman then drew the attention of the meeting to the main issues on which the meeting should focus its attention, and on which decisions are required. He introduced his remarks by reminding participants that GOOS has a dual structure comprising a group of experts (GSC) and an intergovernmental committee (I-GOOS). The GSC is charged with the processes of planning and design, and with providing advice on implementation to I-GOOS. I-GOOS is charged with reviewing and approve these plans on behalf of the Member States, and taking any actions necessary to promote them to the community represented by the membership of IOC, in the process identifying obstacles to implementation and proposing improvements to the design that will facilitate their adoption. In essence, the GSC designs the product and produces prototypes; I-GOOS collectively represents the consumer. It tests the market, provides feedback on the design, sets policy, and finds the money. Actual implementation is carried out by Member States, acting singly or collectively.

- 7 A great deal of progress has been made in planning and initial implementation. We are well into the marketing stage. Some of the 'buyers' have made substantial commitment; many have not. Nevertheless, many Member States have expressed a strong interest in GOOS by participating in its regional development. It is time for I-GOOS to look closely and critically at the causes of buyer resistance, and developing a product line to suit all.
- 8 Would regional development make it easier to attract support from governments, by allowing selective implementation matched to national interests? What links should exist between Regional GOOS's and 'Global' GOOS? Should they be formalized?
- 9 Are the plans emerging from the GSC bodies relevant to national needs and aspirations? How could they be modified or refined? In some cases they might be seen as too prescriptive, in others not detailed enough.
- 10 Can interest be levered by pilot projects like GODAE and Argo? What is needed to promote participation?
- 11 What are the impediments? Funds? Lack of national awareness and interest? Divergence from national goals? Shortage of expertise? Over-specification? Excessive centralization?
- 12 How can the International-intergovernmental system help? What pressures can be brought to bear? How can we collectively mobilize resources?
- 13 If this meeting of IGOOS-V has themes, then they are 'Marketing GOOS', and 'The Regional Development of GOOS'.
- 14 The Chairman concluded by looking forward to an interesting session, hoped that all would find it stimulating and rewarding, and offered a special welcome to countries that have not previously participated.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

- 15 The Committee adopted the agenda for the session (Annex I).

2.2 DESIGNATION OF A RAPPORTEUR

- 16 The Committee designated Mr. R. Nuñez as Rapporteur for the session.

2.3 CONDUCT OF THE SESSION

- 17 The meeting agreed the working hours for the session, and decided to form additional working groups to address specific issues. In response to suggestions from delegations, a sessional Working Group, chaired by a Vice-Chair of the IOC, Mr. David Pugh of the U.K., was created to consider the need for revisions to the paper on Structure, Mandates and *Modus Operandi* of GOOS.
- 18 The Chairman asked Mr. François Gérard (I-GOOS Vice Chair) to chair a sessional Working Group to consider 'Major Issues 2002-2007: Challenges, Barriers and Resources'. Its terms of reference were: to define, in preparation for debate under agenda item 10, the major issues and approaches that will lay out GOOS paths of development, from a national perspective. These might include:

- Preferred form of development of GOOS-related initiatives, e.g. regional GOOS programmes, pilot projects and research;
- Relevance and applicability of GOOS plans;
- Impediments and disincentives;

- What the GOOS organization can do to help;
- Resource-related limitations and how the international system can help to overcome them.

19 The Chairman reminded participants that the officers of I-GOOS were the chairman and two vice-chairs, who were elected at each session. The present vice-chairs were Mr. François Gérard of France and Mr. Vladimir Ryabinin of Russia. Mr. Ryabinin was appointed to chair a small Nominations Committee to assemble nominations for the offices of Chair and two Vice-chairs 2001-2003.

20 The Director of the GOOS Project Office (GPO), Mr. Colin Summerhayes, introduced the documents for the session (Annex II), asked participants to check their details on the participants list (Annex III), and advised participants about the facilities offered within the building. It was explained that due to budget constraints, the working languages of the session would be English and French only, and that documents for the session would only be available in English; they were all accessible on the World Wide Web at the URL: http://ioc.unesco.org/goos/IG5_doclst.htm. He reported that the national reports that had been submitted to date were all available on the GOOS Web Site, and that a hard copy was available for reference purposes. It was hoped that other national reports would soon arrive.

21 Dr. Summerhayes drew the attention of participants to the Draft Resolutions contained in the information packs. A sessional Working Group chaired by Mr. Rodrigo Nuñez was appointed to review and refine draft resolutions from the session, preparatory to presentation to IOC General Assembly.

3. THE STRUCTURE, MANDATES AND *MODUS OPERANDI* OF GOOS

3.1 CHAIRMAN'S REPORT

22 The Chairman presented document IOC-WMO-UNEP/I-GOOS-V/6, which had been prepared for the 21st Assembly of the IOC in response to the call from the 33rd IOC Executive Council (Para 219) for a factual statement of the structure, mandates and *modus operandi* of GOOS. The Committee was asked to consider the document and, if appropriate, to suggest modifications for its presentation to the Assembly, bearing in mind that in the interests of time and translation the present version has already been made available to the Assembly.

23 The Chairman explained that the concept of GOOS was simple. The coordination and advice structure involved the Intergovernmental Committee for GOOS (I-GOOS) and the GOOS Steering Committee (GSC), which provided I-GOOS with scientific and technical advice. The creation of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) should greatly facilitate the implementation of GOOS (at least for the physical components). Implementation could be seen simply as taking place *via* three routes: at the international level (largely through JCOMM), through regional GOOS activities, and at the national level.

24 A lengthy discussion ensued, in which different groups of Member States expressed quite divergent views on the development of GOOS and the respective roles of the GSC-V and I-GOOS. After discussion, it was agreed that the paper constituted a useful comprehensive and factual account of the structure, mandates and *modus operandi* of GOOS, and the Chairman was congratulated on its production. It was recognized that the paper in no way constituted a comprehensive statement about GOOS as a whole, which it was never intended to do. The document will assist further deliberation of what the structure could or should become as GOOS continues to evolve. There were some widely divergent opinions as to what that future structure should be, some preferring to see much stronger intergovernmental control, others preferring to maintain the present relatively high level of flexibility. It was agreed that there should be consideration of some alternative structural models, and of the extent to which intergovernmental control was desirable. Such considerations could feed into the review of GOOS (in 2002) proposed in the Resolution (Annex V).

25 During the discussion, several Member States recognized that while GOOS was a simple concept, its execution appeared complex because of the multiplicity of separate bodies that GOOS had to deal with in implementation. Despite this complexity at the implementation level, those directly involved in executing

GOOS activities professed not to find the complexity confusing. Clearly, different Member States see GOOS in different ways, with those most engaged in its implementation appearing to have the least difficulty in handling or accepting the level of complexity. Those furthest from engagement expressed the most difficulty in understanding how GOOS works or how it may contribute to the solution of national problems.

26 Contributing to the discussion, the Chairman noted that in general, the highest level involvement in GOOS tends to be from agencies acting as proxies for government, rather than from governments deciding to become engaged. A bottom up approach seems to have worked very well in some regions, where groups of agencies have seen the potential in GOOS and banded together to make it work, anticipating that eventually governments at a higher level would experience the benefits and seek greater engagement. Starting at the top and expecting governments to become engaged right away did not seem to work well.

27 I-GOOS recognized that to assist the future participation of those presently not engaged in GOOS, ways need to be found to express to their governments the inherent simplicity of the concept, while recognizing and at the same time minimizing the impact of the intrinsic complexity of the bodies involved in implementation.

28 Some Member States noted that while GOOS has made some very substantial achievements in recent years, as it moves towards the realization of a 'permanent' observing system, with standardized measurements, it is time for its structure to be more closely examined by governments so as to ensure stability, continuity, and appropriate financial support. For this, a strong centralized intergovernmental structure might be needed, not least to attract governmental commitments over a long period of time. The opposing view was that I-GOOS was in the main satisfied with what we have at present, rejecting the centralized control approach.

29 Several Member States approved the development of the present regional GOOS bodies, many of which are inter-agency rather than intergovernmental, which they saw as a primary means for engaging the interests of government agencies and through them the interests of Member States. There was not a uniform agreement on where such bodies should rest within the existing intergovernmental structure.

30 There was general agreement that for the purposes of 'marketing' GOOS within individual countries, it was desirable to refer to GOOS as a programme, rather than as a structural overlay or matrix. While it was also agreed that clearer definition was required of how GOOS relates to regional initiatives, it was accepted that this topic would be addressed further under agenda item 5.4.

31 It was agreed that a central theme in the 'marketing' for GOOS, particularly in the run up to the World Summit on Sustainable Development (WSSD) in Johannesburg, should be sustainable development and the ways in which GOOS would contribute to it. In this context the present document appeared too 'dismissive' of present successes in coastal operational oceanography. It was also noted that the Summit would provide an opportunity to make some very positive statements about the successes of GOOS. Many of the developments in GOOS had been much faster than expected 10 years ago. Furthermore the GOOS concept has had a considerable influence on other organizations, causing them to voluntarily adapt to the new GOOS paradigm. In this context, one Member State suggested that I-GOOS might wish to consider encouraging a set of papers on the achievements and developments of GOOS over the past 10 years to be developed for publication in some appropriate marine policy journal. Others felt it would be more important at the Summit to show what GOOS could provide in support of sustainable development in the coming decade.

3.2 REPORT OF THE SESSIONAL WORKING GROUP ON STRUCTURE

32 The Sessional Working Group met on three occasions, addressing the following Terms of Reference:

- to review and comment on the document on the structure, mandates and *modus operandi* of GOOS (IOC-WMO-UNEP/I-GOOS-V/1 prov); and
- to identify issues for future optimum arrangements for the structure, mandates and *modus operandi* of GOOS, to be addressed by the GOOS Review in 2002.

33 The Group noted that the document had been prepared by the Chairman of I-GOOS in response to the call from the 33rd IOC Executive Council for a factual statement on the structure, mandates and *modus operandi* of GOOS. It was not practicable to effect a revision of the document in the time available: instead the Working Group made a series of observations and detailed comments, which should be transmitted alongside the original document to the upcoming IOC Assembly.

34 The document was a comprehensive account of detailed existing internal and external relationships and responsibilities related to GOOS. Despite this complexity, it was nevertheless possible to understand and present GOOS at a much simpler holistic level than was done in the document. The present complex paper could be confusing to higher government officials, and should be avoided. A shorter simpler document should be prepared for more general presentation.

35 There would be some advantage in redrawing and simplifying the diagrams, which were more complicated than was needed for direct, clear explanations. Figure 2 in particular showed linkages that were not clearly established and understood.

36 The descriptions of GOOS as a system of organization or as a structural overlay, or as an information system were all only partial. It would be more accurate to say that GOOS was structured as a system of organization. In terms of implementation GOOS was a programme that needed funding, and which would deliver needed results.

37 Some amendments were necessary to update the existing Terms of Reference of I-GOOS, the GSC and the GPO, including those concerning relationships with the new JCOMM.

38 The fundamental importance of users of GOOS-derived products and how they were involved in its specification and development was not fully emphasized in the document. In particular, a wide spectrum of users and their needs, in addition to those of global climate prediction (mentioned in paragraph 2 section 4 of the document), had been identified, and were already being addressed.

39 The document did not fully emphasize the various regional alliances that were contributing to GOOS.

40 The Group considered that the following issues *inter alia*, should be addressed as part of a review process:

- The future structure should be the simplest possible to provide effective development and operation.
- Changes appeared necessary to make I-GOOS more effective, and to take work forward between the biennial meetings.
- The boundaries between the responsibilities of the I-GOOS and the GSC, concerning scientific advice, resource planning, policy and implementation were ambiguous.
- The tasks assigned to the GOOS Project Office in its Terms of Reference (ToRs) did not appear to provide the same support to I-GOOS as they did to the GSC. According to the ToRs, the GPO only 'maintains liaison' with the I-GOOS and its officers.
- The role of the GOOS Sponsors *Forum* and the way it contributes to GOOS should be clear, apparent, and accountable.
- The role of the informal GOOS 'Executive Group' should be reviewed as an effective coordinating mechanism.

- The development of regional components of GOOS should ultimately be the responsibility of I-GOOS. Arrangements are needed so that regional alliances can be based on existing IOC, WMO and UNEP structures. Mechanisms should be established so that the different regional experiences can be shared.

41 There is a perception that I-GOOS has operated too much as a ‘rubber stamp’, not taking decisions or initiating actions. It has not been able to provide the support and guidance needed by the GSC, and other components of GOOS, for the following reasons:

- Meetings are held only every two years.
- They are held too close to the IOC Assembly for further work to be completed before the Assembly meets.
- The GPO is not specifically charged with providing support structure for intersessional work.
- No mechanisms are traditionally set up for intersessional work, e.g. working groups.

42 To cope with these defects it was strongly urged that I-GOOS should establish an Executive Board/Bureau, to undertake intersessional work including perhaps:

- identify and mobilize resources, including those for capacity development;
- conciliate the policy, science and user needs;
- redraft the ToRs of GOOS bodies as necessary;
- promote interaction among regional components of GOOS;
- develop and clarify the legal framework of GOOS, where necessary.

43 This Bureau could include the Chair and Vice-chairs of I-GOOS and representatives of GOOS regional components, and should be serviced by the GPO.

3.3 DISCUSSION OF WORKING GROUP RECOMMENDATIONS

44 I-GOOS congratulated the Working Group on providing a valuable set of comments on how the structure and business of I-GOOS might be improved. The various points made should be considered in the proposed review of GOOS in 2002. It was recognized that as GOOS moves out of the planning stage and into implementation, there is a new and growing role for I-GOOS to play. I-GOOS agreed that it would not be necessary to wait for the conclusion of a review to start work on the many good suggestions in the Working group report. It therefore decided on a set of recommendations that are documented below under agenda item 10.3, and which included the creation of an I-GOOS Board or Bureau, along with several *ad hoc* Intersessional Working Groups.

45 I-GOOS recognized that the creation of a support structure for I-GOOS, in the form of an I-GOOS Bureau and associated sessional groups, would place an additional burden on an already stretched GPO. Member States were urged to provide either financial support, or support in kind, to assist the GPO in arranging and funding the new range of activities required. One possibility would be for Member States to second staff to work with the GPO on a part time or full time basis. Given the existence of electronic communications, it was not absolutely necessary for such staff to be posted to Paris – they could work on I-GOOS business in their usual offices, but under the direction of the Director of the GPO.

4. STATUS OF GOOS PLANNING

4.1 THE GOOS STEERING COMMITTEE (GSC)

46 The Chairman of the GSC, Prof. Nowlin gave an overview of the recent work of the GSC. He described GOOS as a user-oriented system to develop and supply products and services to a wide range of users. He used an activity structure diagram based on that presented at I-GOOS-IV (see Annex V of GOOS Report No. 72) to explain that at the most simple level, the GSC focused its efforts on four main functions: (i)

scientific design and guidance; (ii) implementation oversight; (iii) liaison and integration; and (iv) outreach and infrastructure.

47 The Scientific Design and Guidance Function was concerned mainly with system design, responsibility for which lay with just two groups: the Ocean Observations Panel for Climate (OOPC) and the Coastal Ocean Observations Panel (COOP). These in turn took responsibility for selected higher levels of scientific or technical activity, carried out by time-limited working groups like the OOPC's one for sea surface temperature, or through pilot projects like the Global Ocean Data Assimilation Experiment (GODAE) and the Argo profiling float project.

48 The Implementation Oversight Function was equally simple in having two main sub-functions, one global and one regional. Responsibility for oversight of implementation at the global level rested with the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), which was just completing its two week long first session in Iceland. Acting on advice from GOOS, JCOMM would be responsible for implementation of observing programmes currently carried out by such pre-existing groups as the Ship-of-Opportunity Programme Implementation Panel (SOOP-IP), the Data Buoy Cooperation Panel (DBCP) and the Global Sea-Level Observing System (GLOSS). Responsibility for implementation at the regional level rested with regional bodies, like EuroGOOS, NEAR-GOOS and others, some of which were intergovernmental, and some of which were inter-agency associations, and all of which acted on advice from the scientific design panels and followed GOOS Principles.

49 The Liaison and Integration Function occupied much less time and effort than the first two Functions. It was there to ensure that GOOS communicated with, and interacted as appropriate or necessary with, other groups involved in global observations. The fact that there were many such groups did not make GOOS complicated. They could be grouped crudely into four categories. First were the sister global scale observing systems, like the Global Climate and Global Terrestrial Observing Systems (GCOS and GTOS), and the World Weather Watch and Global Atmosphere Watch (WWW and GAW). Second were the global scale research programmes needed to underpin future global scale observations, like the World Ocean Circulation Experiment (WOCE), or the Global Ecosystems Dynamics Project (GLOBEC). Third were the major Conventions. The fourth group involved partnerships through which GOOS was trying to increase its influence, or through which it was gaining support of some kind. These included: (i) the Partnership for an Integrated Global Observing Strategy (IGOS) (see agenda item 4.5), through which there was a strong link to the space agencies; (ii) the Partnership for Observations of the Global Ocean (POGO), through which there was a strong link to the major ocean academic institutions; and (iii) links to the main marine science and fisheries bodies, ICES (International Council for Exploration of the Sea), for the North Atlantic, and PICES, the sister organization to ICES for the North Pacific.

50 Finally, the Outreach and Infrastructure Function was also simple, having two main elements: (i) communications, which included brochures, web material, publications and reports; and (ii) capacity building, which included a lot of the activities of the IOC's Regional Programme Office (for GOOS), in Perth, Australia.

51 The GSC saw as the basic building blocks for GOOS the activities of nations, as manifested through their government departments, commerce and industry, non-governmental organizations and academic institutions. The GSC noted that many nations, or the agencies within them, had grouped together to form Regional GOOS Alliances. One basic avenue for GOOS implementation would undoubtedly be the activities of these regional groups, which would complement the global observations in such a way as to permit production of products and services needed specifically for each region.

52 In discussion of this item, I-GOOS noted that GOOS is already making connections with the environmental conventions, most notably the UNFCCC. At the regional level regional GOOS bodies like BOOS in the Baltic are very well connected with HELCOM, the regional convention for the Baltic. In addition, EuroGOOS is engaged in discussion with OSPARCOM, the convention secretariat covering the North Sea and adjacent North Atlantic. MedGOOS has links to the Mediterranean Action Plan and the Barcelona Convention. Other examples of such links are discussed in agenda item 5.4.

- 53 I-GOOS noted that over the past two years several measures had been taken to improve the efficiency and effectiveness of the GOOS organization. The GSC had streamlined the structure, eliminating 6 committees and replacing them with one. The membership of the GSC had changed from predominantly academic to about 50% operational, as requested by the GOOS sponsors. An Executive Committee ensured the smooth functioning of the GSC intersessionally. A schedule is being established for GOOS activities, to detail anticipated actions by year for the period 2002-2006, and for the five-year period 2007-2011.
- 54 I-GOOS noted that in the view of the 4th session of the GSC, the efficiency and effectiveness of the GOOS organization would depend not only on international coordination, but also on the presence of effective national institutions. To take GOOS forward required either the strengthening of present national structures or the development of new ones. As a major step in facilitating active involvement in GOOS, nations should create National GOOS Coordinating Committees (NGCCs) in which all key stakeholders are involved/represented, including:
- Government departments;
 - Academic institutions;
 - NGOs;
 - Key industrial/commercial sectors;
 - Local government institutions.
- 55 I-GOOS noted that the concept of the NGCC was first formulated by the GOOS-AFRICA Coordinating Committee at its first meeting (Maputo, July 1998) (GOOS Report 62), and revised by the 2nd session of the GOOS Steering Committee (April 1999), with the addition of an extra (9th) task (see Annex IV). The concept was endorsed by I-GOOS-IV (June 1999). Since then, several such committees had formed, but more were needed.
- 56 I-GOOS appreciated that NGCCs differ from the National Oceanographic Committees promoted by the IOC in being narrower in scope (focusing on GOOS), but broader in Membership (embracing all potential users of GOOS products). NGCCs could exist alongside NOCs, or be specially designed subcommittees of NOCs. Their main tasks would be as described in Annex IV, the first and probably the most important being to determine user needs and specify the data and products required to satisfy those needs;
- 57 Ideally, it is the coordination between national agencies that takes place in NGCCs that should provide the basis for effective briefings of delegates to I-GOOS and the IOC, and facilitate the coordination of multi-national GOOS regional activities, as well as improving the utilization of GOOS products. In this context, at its 4th session (March 2001), the GSC noted:
- that not all nations had established NGCCs, and (partly as a result);
 - that several national representatives to I-GOOS meetings did not represent the requirements of operational oceanography nor the interests of the wider user community in their own countries.
- 58 I-GOOS recognized that it had already agreed at its last session that NGCCs would be useful to encourage linkages at the national level between all stakeholders. Several delegations strongly supported the formation of such committees, having found them extremely useful in their own countries, for example for bringing agencies together to develop a common strategy for ocean observations, and for helping make GOOS visible to local policy makers. The Committee recognized that individual countries might wish to implement such committees in different ways to suit their local needs. It was not appropriate to be too prescriptive. Such committees should coordinate with National Oceanographic Committees, and involve the IOC contact points.
- 59 In accordance with the wishes of the GSC, and recognizing that what was required was entirely complementary to the creation of National Oceanographic Committees, I-GOOS agreed to recommend that the IOC should encourage Member States with interests in GOOS (i) to form National GOOS Coordinating Committees representing all key stakeholders, including government departments, academic institutions, NGOs and industrial/commercial sectors, and (ii) to ensure that the national representatives selected to attend I-GOOS represent the interests of a broad range of operational agencies and users of GOOS products.

60 I-GOOS noted that the membership of the GSC and its advisory committees is subject to approval by the sponsoring organizations of GOOS. The procedure is that Member States and sponsoring bodies are asked to suggest candidates for these bodies. The GSC then considers which candidates meet the current requirements, bearing in mind discipline, geographic and gender balance and so on, then passes a slate of candidates to the sponsors for consideration and approval. The advisory bodies and membership are all time limited.

61 I-GOOS debated what should be done to improve the links between GOOS and governments, and to encourage further involvement in GOOS from other IOC delegations. I-GOOS could provide a mechanism for passing user requirements from GOOS advisory bodies to Member States.

62 Some delegates noted that since I-GOOS is the intergovernmental body charged with GOOS implementation, it should be part of a well-developed hierarchy, with subsidiary bodies answering to it. Other delegations were not convinced that the time was ripe for such a change, because GOOS was at an early quasi-operational stage in its development, where many of its operations were being made by research organizations on research funding, rather than by operational agencies with operational funding, which was the eventual goal. Co-sponsorship of the GSC by ICSU was a reflection of the involvement of the research community in initial GOOS activities.

63 The Committee congratulated Prof. Nowlin on the considerable progress made during the intersessional period by the GSC in taking forward the designs for GOOS and the plans for implementation. The GSC is considered to be a very effective body.

4.2 THE OPEN OCEAN: OOPC AND OCEANOBS'99

64 The design of GOOS activities for the open ocean is the responsibility of the Ocean Observations Panel for Climate (OOPC), chaired by Dr. Neville Smith. Since I-GOOS-IV, the OOPC had held its 5th session, in Bergen, Norway (June 20-23, 2000), and its 6th session in Melbourne, Australia (April 2-5, 2001). The OOPC had been a prime organizer of the Ocean Climate Observations Conference in St Raphael, France (October 18-22, 1999), and in several meetings of the teams working on the Global Ocean Data Assimilation Experiment (GODAE) and the Argo Pilot Project, among others.

65 On behalf of Dr. Smith, Prof. Nowlin, Chairman of the GOOS Steering Committee, gave a brief overview of progress achieved in the design of the climate module of GOOS, focusing on the activities of the OOPC, and leaving aside the OOPC's pilot projects GODAE and Argo, which would be dealt with under agenda item 5.2. He noted that the terms of reference of the OOPC had recently been adjusted slightly to recognize the fact that the group was responsible not just for climate but rather 'to monitor, describe and understand the physical and biogeochemical processes that determine ocean circulation and effects on the carbon cycle and climate variability, and to provide the information needed for ocean and climate prediction, including marine forecasting'.

66 I-GOOS noted the success of the OOPC in organizing the OceanObs99 conference in St Raphael (October 1999), and the agreement reached there between operational and research communities on the design plan for sustained ocean observations needed for climate and marine services and climate-related research, and on the timely sharing of ocean data. Noted also was the successful workshop in Perth, Australia (November 2000) to consider the development of an observing system for the Indian Ocean, and the time series workshop held in Woods Hole (21-23 May 2001) with the support of the Partnership for Observations of the Global Ocean (POGO).

67 I-GOOS noted the following significant activities by the OOPC: a review of the upper ocean thermal network, the creation of a workshop to define requirements for sea surface temperature (SST), the creation of a high resolution SST pilot project, the creation of a surface flux analysis project (SURFA), the creation of a science team to develop a programme of time series stations for sustained observations, and the provision by the OOPC to the Conference of the Parties to the UN FCCC (*via* the good offices of GCOS), of advice on ocean observations for climate. I-GOOS also noted that the OOPC was jointly sponsored by GOOS, GCOS

and the WCRP, which enabled it to consider not only the observations needed for GOOS, but also the research required to improve and enhance GOOS observations in future.

68 The Committee congratulated the Chairman and members of the OOPC on the progress achieved to date in developing the design for the open ocean component of GOOS, and in tackling the important research questions that had to be addressed to improve the quality, quantity and accuracy of GOOS observations and the output from the processing of GOOS data. I-GOOS noted with approval the constructive links that were developing between the OOPC and JCOMM.

4.3 THE COASTAL OCEAN: C-GOOS, LMR, HOTO AND COOP

69 The design of GOOS activities for coastal seas is the responsibility of the Coastal Ocean Observations Panel (COOP), co-chaired by Dr. Tom Malone and Dr. Tony Knap.

70 On behalf of the COOP co-chairs, Prof. Nowlin gave an overview of progress achieved in the design of GOOS for coastal seas. Initially this work was carried out by the Coastal (C-GOOS), Health of the Oceans (HOTO) and Living Marine Resources (LMR) Panels of GOOS, which since I-GOOS-IV had held several meetings including the 4th session of the C-GOOS Panel (Tianjin, China, November 2-5, 1999), the 5th session of the C-GOOS Panel (Gdansk, Poland, May 2-5, 2000), the 3rd session of the LMR Panel (Talcahuano, Chile, December 8-11, 1999), the 4th session of the LMR Panel (Honolulu, May 1-5, 2000), and the 5th session of the HOTO Panel (Paris, September 25-29, 2000).

71 Prof Nowlin noted that strategic design plans had been produced by the three Panels (GOOS Reports 90, 94 and 99), and that these plans form a solid basis on which to construct an integrated plan for the implementation of GOOS in coastal seas. The design plans are published on the GOOS web site and can already be used for advice by Member States in setting up GOOS at the local level.

72 Prof. Nowlin noted that the initial three panels had now been successfully integrated into the new Coastal Ocean Observations Panel (COOP), whose job it would be to produce an integrated design plan for coastal seas. COOP had already held two meetings, the first in San Jose, Costa Rica (October 2000), and the second in Trieste, Italy (June 2001). Good progress was being made in the production of the integrated design plan. Progress was aided by consultations with the user community on their requirements, through the medium of GOOS Users' *Fora* (see next agenda item). It is clear that there is a set of common variables that if measured for long enough and with the required resolution should be used to detect and predict changes in the coastal ecosystems.

73 I-GOOS noted these new developments with great interest. Portugal questioned whether sufficient attention is being given to pollution, now that the HOTO Panel has been dissolved. I-GOOS noted that COOP contained several members of the former HOTO Panel, that the chair of the former HOTO Panel was one of the co-chairs of COOP, and that COOP was expected to produce a design integrating physical, chemical and biological aspects, including pollution.

74 The Committee was pleased to see the rapid progress being made by COOP and looked forward to seeing the eventual strategies for design and implementation. I-GOOS looked forward to seeing strong links develop between COOP and JCOMM, once the integrated COOP design had been published.

4.4 INTERACTION WITH USERS: THE FIRST GOOS USERS' FORUM

75 I-GOOS noted that a major challenge, and a charge, to the COOP is to involve users in the design and implementation of the integrated coastal component of GOOS. The GSC, at its 3rd session, endorsed the concept of GOOS Users' *Fora*, with the goals of:

- ensuring that the design and implementation of the coastal component of GOOS reflect the priorities of national and regional GOOS bodies;
- strengthening national and regional GOOS activities by facilitating exchange of information on new technologies, approaches, and knowledge among participating nations; and
- promoting the global scale implementation of all components of GOOS.

76 I-GOOS noted that this new mechanism was a further development of the successful one-day meetings that the Coastal GOOS and Living Marine Resources Panels had held with stakeholders prior to their Panel meetings. The purpose of both the stakeholders meetings and the Users' *Fora* were to familiarize the Panel with local and regional requirements for environmental information, and to familiarize the regional stakeholders with GOOS. The meetings enabled COOP to interact with the users community, so as to (i) take user needs into consideration in developing the design for a coastal GOOS, and (ii) inform the user community about coastal GOOS developments.

77 The 1st GOOS Users' *Forum* was held in San Jose, Costa Rica, 13-14 November 2000, prior to COOP-I, and focussed on Latin American/Caribbean user needs. The 2nd GOOS Users' *Forum* was held on 5th June 2001 in Trieste, just prior to COOP-II, and focussed on ongoing research and observational programmes in the Adriatic.

78 I-GOOS endorsed the practice of *Users' Fora* in many different contexts, as mechanisms for engaging the users' interest and support as well as for determining their requirements. I-GOOS recalled that the 1st GOOS *Forum* with users was held in association with I-GOOS-III (June 1997). The function of that meeting was different from that of the users' *fora* associated with COOP, which were designed to help the design panel make a design consistent with user requirements. I-GOOS should hold another GOOS *Forum* to mobilize national support and resources for activities such as capacity building, and establishing/enhancing systems.

4.5 THE OCEANS THEME AND THE CARBON THEME OF THE IGOS PARTNERS

79 Dr. Summerhayes reminded participants that both the IOC and the GOOS Project Office were members of the Partnership for an Integrated Global Observing Strategy (IGOS), which had been chaired until June 1st by Patricio Bernal, the Executive Secretary of the IOC. On behalf of Dr. Bernal, Dr. Summerhayes reported on progress made by the IGOS Partners towards the development of the strategy, in particular through the development of the Ocean Theme and a Carbon Theme. He reminded participants that the partners comprised the UN agencies (including the IOC), the Offices/Chairs of the Global Observing Systems (including GOOS), the major research organizations (ICSU, IGBP, and WCRP) and the Committee on Earth Observation Satellites (CEOS). It provided a useful forum in which the organizations responsible for different aspects of earth observation at the global scale could compare notes, coordinate activities and develop strategies. The IGOS Partnership has been endorsed by the IOC governing bodies. The partnership produces brochures from time to time to explain its activities and benefits to nations, and is likely to produce one for the World Summit in Johannesburg in 2002. More information about the IGOS partners can be obtained from their web site, now managed by the IOC: <http://www.igospartners.org>.

80 The partners recognize that no single member can do all that is required to provide a comprehensive earth observing system. In order to provide some focus for their activities they agreed to focus on particular themes that addressed key issues of pressing social interest. In that one of these is environmental change and the role of the oceans in environmental change and sustainable development, and because GOOS was seen to be a well developed concept, the Partners decided to begin with an Ocean Theme. The Ocean Theme report outlines a strategic design for ocean remote sensing over the next decade. For the *in situ* component, GOOS has done a good job over the last decade in providing a vision for *in situ* ocean monitoring. A challenge

remaining for the Partners is to fully integrate and harmonize these two approaches. The Partners have taken steps to begin this task. Eric Lindstrom of NASA now serves as CEOS representative to the GOOS Steering Committee. The IOC GOOS Office has taken over leadership for reporting on implementation and is seeking resources for support staff in the remote sensing area.

81 The realization of the IGOS Partners' vision – continuity of systematic measurements, exploratory missions and projects to expand capacity for important additional observations, and support for “end-to-end” systems, depends on the actions of individual agencies and nations. They may act in concert and with great harmony as long as the IGOS Partnership maintains a credible strategy and an attractive vision of a successful future observing system and information exchange.

82 The IGOS Partnership will manage the strategy, but not the implementation, which will be carried out by responsible agencies. IGOS-P will review and revise the Ocean Theme on a regular basis (2-3 years) taking into account successes and failures in implementing its vision. Through a rolling review process, the requirements for satellite observations of the ocean will be fixed for two years from the publication of the theme report (January 2001), then reviewed during the third year, before the revised strategy is published. The Partners provide the framework of an overall strategy for achieving a common vision, then leave enormous creativity and initiative in the hands of individual agencies and nations to get the job done. As in the case of GOOS, this process seems to be working well.

83 The IGOS-P has now adopted a proposal for developing an Integrated Carbon Observing Theme. The OOPC and the GPO have worked with the wider community to develop the Ocean Component of that Theme, and publication of the resulting document is expected by year-end.

84 I-GOOS noted that these developments reflected very well on the state of GOOS development, which had influenced the partners to choose the Oceans as their first theme. I-GOOS endorsed the Ocean Theme document, endorsed the three-year review period for future requirements, and agreed to recommend that the IOC urge Member States to make the Ocean Theme widely known as a blueprint for action.

5. STATUS OF GOOS IMPLEMENTATION

5.1 THE GOOS INITIAL OBSERVING SYSTEM

85 Dr. Summerhayes described the present configuration of the Initial Observing System (IOS) for GOOS, which is an amalgam of existing international *in situ* and remote sensing observing subsystems, and pilot projects such as PIRATA, as well as telecommunication facilities (GTS), data management systems (GTSP) and mechanisms for product delivery (JCOMM Products Bulletin). He noted that one or two additions had been made to the GOOS-IOS since its creation in 1998. Japan requested that the TRITON array be added to the TAO Array under the heading of the tropical observation system mainly for ENSO forecasting.

86 The observing system will grow through further formal commitments and contributions from large global programmes, JCOMM activities, and national commitments to the GOOS regions and national coastal systems. To assist in this process it is necessary to know what is currently being done. To that end, the GPO has already carried out a provisional inventory of shelf seas observing systems. In surveying activities in Europe, EuroGOOS has estimated provisionally that there are 5,000–10,000 routine and repeated observation stations and platforms contributing operational marine data to the management of coastal seas. We need to know exactly what instruments and sampling equipment are used and where. This information is needed in order to optimize the design of the sampling strategy, and to enable instruments installed by different agencies to provide data sets to other agencies, and to develop the right communication systems, linking to modelling centres. In this context, EuroGOOS has started to develop a European Directory of the Initial Observing System (EDIOS), which has been funded by the European Commission (EC).

87 I-GOOS welcomed the fact that a consultant (Mr. Bert Thompson) had been hired to work with Member States so as to ascertain what parts of their national observing systems they had committed to GOOS should become parts of the GOOS-IOS, and several delegations offered their strong support for his activities.

88 I-GOOS felt that the GOOS-IOS provided a practical demonstration of how GOOS is getting off the ground. It is proof of the existing global interest and investment in global observations. Its existence has helped to encourage coordination between pre-existing bodies, and to eliminate duplication. Examples include the revision of the SOOP programme in the light of development of the Argo float programme, and the ongoing attempt under JCOMM to integrate three voluntary observing ship programmes: the Voluntary Observing Ship programme of the WMO for collecting marine meteorological observations, the SOOP for collecting XBT data on upper ocean thermal properties, and ASAP, the Automated Shipboard Aerological Sampling Programme of the WMO.

89 I-GOOS agreed that each observing sub-system should be working to appropriate specifications. Those for the observations recommended in the OOPC's Action Plan for physical measurements for GOOS/GCOS have already been published, and are the basis for OOPC's recommendations, through GCOS, to the Conference of the Parties to the UNFCCC. Specifications for coastal GOOS components are currently being developed by COOP. Each of the subsystems of the GOOS-IOS had some mechanism for working to a set of specifications and reporting on performance. The work of the DBCP, SOOP and Argo Coordinators at the IOC's JCOMMOPS Centre in Toulouse was a case in point. The OOPC is considering how to establish performance measures for GODAE. Nevertheless, recognizing the complexity of GOOS, the GOOS Data and Information Plan (agenda item 6.2.1) called for the employment of Data Coordinators to monitor the flow of data and information through the system. I-GOOS recognized that coordinating data and information flow and monitoring performance at the national level might be expected to be more complex, given the multitudes of observations possible in coastal waters. However, each national agency collecting observations and delivering products has as part of its mandate a responsibility to monitor quality and performance. It is not necessary to expect that GOOS should somehow take over this function from those agencies. What we should expect is that national, regional and international systems worked to certain specifications against which their performance should be monitored. In addition it was necessary to compare different parts of the observing system against each other to reduce redundancy to an acceptable level. This had been done for SOOP, for instance, in the context of the arrival of the Argo project.

90 I-GOOS noted progress in the development of the IOS and endorsed its continued development.

5.2 GODAE AND ARGO

91 As explained above in section 4.2, the OOPC carries overall responsibility for the development of the Global Ocean Data Assimilation Experiment. On behalf of the chairman of the OOPC, Dr. Neville Smith, Prof Nowlin gave an overview of progress achieved in implementing GODAE, which was a pilot project of the OOPC, and of the OOPC sponsors: GOOS, GCOS and the WCRP. GODAE's main objective was demonstration of capability to utilize satellite and *in situ* data within numerical models for the production of useful products from global to regional/local scales. It was being organized in three phases: (i) the Preparation Phase (1999-2002); (ii) the Implementation Phase (2003-2005); and (iii) the Transition Phase (2006-2007) to accommodate the transition of successful GODAE systems to operational status.

92 GODAE was working to a set of principles and guidelines. First there was the GODAE Commons, represented by commonly shared data, products, and servers, accumulated knowledge base. GODAE was directed at the synthesis of satellite and *in situ* data within models; it aimed at statistical characterization of products; it involved dedicated improvement cycles; and it would develop pilot projects for enhancements and adaptations. At present there were two such projects: (i) the High Resolution SST project, and (ii) Argo.

93 GODAE was now being run through a GODAE Bureau, in Melbourne, and being supported financially by a Group of Patrons, mostly space agencies. Its scientific programme was being developed by and International GODAE Steering Team, which had already met 4 times, produced a Strategic Plan, and begun drafting an Implementation Plan.

- 94 Several countries are engaged in national modelling efforts that will contribute to the eventual success of GODAE, including France, through its MERCATOR project. The 2001 version is a model of the North and tropical Atlantic (70N-20S) with a $1/3^\circ$ resolution that assimilates altimetric data and runs routinely in real-time. It provides physical analyses (nowcasts) and 15 days forecasts at all depths for temperature, salinity, currents, and dynamic height. *In situ* observations come from Argo (CORIOLIS) profilers. Products are available weekly on line at www.mercator.eu.org.
- 95 The 2002 Version will operate a North Atlantic and Mediterranean high-resolution ($1/15^\circ$) model routinely in real-time, assimilating altimetric and *in situ* data, and providing 3D analyses and forecasts of the ocean in these areas. It will also operate a global, low-resolution (2°) ocean model routinely in real-time.
- 96 The 2003 Version will be similar but the resolution of the global model will increase to mid resolution ($1/4^\circ$).
- 97 Stan Wilson of NOAA made a presentation on Argo, a project to seed the ocean with 3000 profiling floats spaced about 300 km apart and recording vertical profiles of temperature and salinity over the top 2000m of the water column once every two weeks. Argo will in some respects be like a Real-Time Upper-Ocean WOCE, enabling us to determine for the first time the broad-scale spatial and temporal variability of the ocean circulation globally and synoptically. We can already observe the sea surface in this way from satellites. Having both *in situ* and satellite data of this kind to assimilate into numerical models of the ocean will greatly improve the accuracy of model outputs and forecasts. The data will be especially useful for weather, climate, and hurricane forecasts.
- 98 Argo was initiated in 1999 and has grown from 55 floats that first year, to 703 proposed for funding in 2002. To sustain a 3,000-float array, it is estimated that 825 floats will be needed per year, a goal which could be achieved by the end of 2005. The cost of the 3,000-float array is about \$20,000,000, to be borne by the international partners (at present, 13 countries plus the European Commission). The cost per profile is calculated to be about \$170, similar to the \$100 for XBT profiles. Argo floats will make salinity measurements that XBTs do not, hence justifying the cost increase per profile.
- 99 Argo has been endorsed by IOC and WMO as an important component of the operational observing system of GOOS and GCOS, and as a major contribution to CLIVAR and other research programmes. Data and derived products from Argo floats will be freely available in real-time and delayed mode. Funds provided by Member States through IOC have been used to set up an Argo Information Centre (AIC), under JCOMM, with Mathieu Belbéoch hired as full-time Technical Coordinator. The AIC will provide services for Argo like those provided for DBCP & SOOP.
- 100 To assist Argo deployments, Regional Implementation Planning Meetings have been held for the Pacific Ocean (Tokyo, April 2000), and for the Atlantic (Paris, July 2000), and are planned for the Indian Ocean (Hyderabad, July 2001). One consequence of the Pacific meeting was the negotiation with Pacific nations, *via* the South Pacific Applied Geoscience Commission (SOPAC), of a consensus regarding the deployment of Argo floats in relation to Pacific island Exclusive Economic Zones.
- 101 Mr. Etienne Charpentier, Technical Coordinator of the JCOMM Operations Centre in Toulouse, reported on the outcome of the June 2001 meeting of the IOC's Advisory Body of Experts on the Law of the Sea (ABE-LOS). The meeting had sought among other things to establish how the Argo project related to the provisions of the United Nations Law of the Sea (UNLOS). Argo floats will collect ocean data and relay it *via* the Global Telecommunications System (GTS) of WMO to operational centres in real time, and to other (research) centres. The data will be used by the operational centres to underpin ocean, weather, and climate forecasts. Argo is designed to provide a demonstration of the operation of a key new part of GOOS. As is the case for the ocean data acquisition systems of other similar programmes, like the drifting buoys of the Data Buoy Cooperation Panel (DBCP) and the disposable bathythermographs (XBTs) of the Ship of Opportunity Programme (SOOP), Argo floats would be used for operational ocean monitoring despite the fact that they would also serve the needs of the research community and often, though not in all cases, were paid for through research budgets. I-GOOS noted that the ABE-LOS meeting had not been conclusive on this topic and that it seems likely that the IOC Assembly may require more work on this issue.

102 Uwe Send, representing the WCRP, gave a presentation on the progress being made in establishing a sustained global network of long-term time series stations for detecting ocean variability and climate change through multidisciplinary ocean observations. The plans are being developed by an international Science Team, sponsored by GOOS/CLIVAR/POGO (via OOPC/COOP), which held its inaugural meeting on 21-23 May 2001 at Woods Hole. A 5-year pilot project was defined. The first tasks included defining an initial set of 50 or so locations, developing a rationale for establishing each element, building on existing sites, identifying gaps, and considering funding requirements. Sites were selected on the basis of their ability to supply critical information from key regions. It is intended that data will be freely available and exchanged in real time. The "Initial Time series Observing System" comprises all operating sites (around 25) and those planned to be established within 5 years. During the first 5 years (2001-2006) the team will work to identify and fill gaps, develop new technology for sensors and moorings, identify products and end users and provide users with data, solicit funding and work with POGO to begin to build capacity in developing countries. An important part of the capacity building would be the transfer of know-how to enable complex moorings to be built and deployed. In the post-Pilot Phase deployment of the global array will be completed, and work will begin on a transition to operational status.

103 In discussion, the UK noted that the European Commission was funding the first phase of another GODAE modelling project named ESODAE, which would need further support for its full implementation. Japan noted that it is extensively involved in both GODAE and Argo in the Pacific.

104 I-GOOS was impressed with the extent of progress in GODAE, Argo, and now the development of long-time series, and endorsed the plans and directions of these three programme areas.

5.3 JCOMM

105 Dr. Summerhayes reported on progress made at JCOMM-I (Iceland, June 19-29) in the development of JCOMM and its significance for the ongoing implementation of GOOS. JCOMM-I had endorsed the overall JCOMM structure in which the Chairs of GOOS, GCOS, and IODE are part of the overall management team, thereby ensuring a strong link to GOOS. Mr. J. Guddal (member of GSC and COOP) was elected co-chair for marine meteorology, and Ms. S. Narayanan (MEDS, Canada) was elected co-chair for oceanography. These appointments will help to strengthen links to GOOS. Further acceptance of strong links to GOOS came through: (i) commitment to implementation of an integrated operational ocean observing system for climate, based on the published Action Plan for physical measurements for GOOS/GCOS (based on OOPC reports); and (ii) commitment to work with COOP as its implementation requirements mature, so as to determine the extent to which these emerging requirements may be met by present or future structures of JCOMM, or by other means. In principle, JCOMM is expected to take these new kinds of data on board. JCOMM-I agreed on plans to develop a strong capacity building programme, based on the combined strengths of WMO and IOC. As mentioned in agenda item 5.1, it committed to integrate the shipboard programmes of the VOS (Voluntary Observing Ship programme for marine meteorological measurements), the SOOP (ship-of-opportunity programme for disposable XBT measurements), and the ASAP (Automated Shipboard Aerological Sampling Programme). It also accepted the IOC JCOMMOPS Centre in Toulouse as the vehicle for managing/coordinating operations for three JCOMM programmes: SOOP, DBCP, and Argo. JCOMM-I accepted the yachts of the International SeaKeepers Association as a new class of Voluntary Observing Ship (VOS), collecting meteorological and oceanographic measurements. This new programme may turn out to be useful to the goals of COOP. JCOMM accepted the need for more effective integration of *in situ* and satellite data within the observations programme area. It was gratifying to see a successful working relationship develop between the meteorological and oceanographic communities attending this first, historic meeting.

106 The Technical Coordinator of the JCOMM Operations Centre in Toulouse (Etienne Charpentier), explained the administrative developments in support of Argo, and the mechanisms for providing information on Argo to Member States, referring to document IOC-WMO-UNEP/I-GOOS-V/8-9 Sup 1.

107 I-GOOS agreed that the AIC was already very effective, providing confidence that the Argo project would be professionally managed. Mr. Charpentier was congratulated on the success being made of the coordination of the SOOP, DBCP and Argo programmes through the JCOMMOPS Centre of which the AIC was a part. I-GOOS noted that the main funders for the Argo Coordinator's position were the UK, France,

Canada and the USA, with the USA bearing the lion's share. I-GOOS invited all Member States to contribute to the funding for the Argo Coordinator's position.

- 108 I-GOOS noted with enthusiasm the satisfactory conclusion of the first session of JCOMM, and felt that the developments there augured well for JCOMM being able to operate as an implementation arm for I-GOOS. The Chairman noted that positions are available on the JCOMM ocean observations team.

Action: Members were invited to suggest appropriately technically qualified candidates for JCOMM working groups.

Action: The GSC Chair, through his position on the JCOMM Management Committee, was asked to keep a watching brief on JCOMM developments and to ensure to the extent possible that such developments were consistent with the interests of I-GOOS. In addition, the Chairs of COOP would be asked to work with the JCOMM Rapporteur appointed to investigate COOP requirements for the JCOMM Management Committee.

5.4 REGIONAL AND NATIONAL GOOS IMPLEMENTATION

5.4.1 Regional GOOS policy

- 109 The Chairman reported on the development of a policy governing the regional development of GOOS, drawing attention to document IOC-WMO-UNEP/I-GOOS-V/10. He reminded Members that such a policy had been called for by I-GOOS at its previous session in June 1999.

- 110 I-GOOS congratulated the team that had created the policy document, finding it a useful signpost to the future. After some deliberation, in which it was obvious that some parts of the document needed more thought, I-GOOS agreed to form an intersessional group to build on this document and further develop the regional policy, which should not be too prescriptive. Through such a policy I-GOOS should be able to recognize new regional groups, encourage support of regional groups, ensure appropriate vertical coordination with central GOOS bodies, and encourage coordination horizontally between regional groups.

- 111 UNEP noted that the differing degrees of success may be expected of regional alliances in different areas, reflecting the extent of coordination and cooperation between different government departments with responsibilities for marine affairs within the different countries involved in regional alliances.

5.4.2 Regional GOOS activities

- 112 Representatives of regional GOOS bodies reported on progress in the development of GOOS at the regional level.

- 113 Indian Ocean GOOS: Mr. Bill Erb, of the IOC Regional Programme Office in Perth, presented the case for an Indian Ocean GOOS. The strategy, which was provisional at this stage, had been prepared in consultation with contacts throughout the region, and discussed at a workshop in Perth in November 2000, on 'Sustained Observations for Climate in the Indian Ocean'. The strategy recognizes that the Indian Ocean is grossly under-sampled. There is a considerable need for observations of major but poorly understood phenomena, such as the Indian Ocean Dipole, in the Indian Ocean. There is also a lack of capacity in the region to carry out large scale ocean observing and forecasting efforts. The strategy is directed at identifying the user needs, the observational requirements, the existing subsystems, the gaps in coverage, the present technical capacity, and the capacity building needs. The strategy encourages the involvement in the Indian Ocean of Member States from outside the region but which are capable of and willing to make available data from observing programmes. Thus the IO-GOOS group, when formed, is likely to comprise Indian Ocean and non-Indian Ocean nations.

- 114 To take matters forward, an IO-GOOS meeting is planned for New Delhi during November 2001, hosted by India's National Institute of Oceanography. Meeting participants will further consider the Indian Ocean strategy, and decide how they wish to see it developed and implemented. This group will provide the

nucleus of an IO-GOOS regional body. That meeting will be followed in early 2002 by a major workshop organized by the OOPC and designed to plan the implementation of an ocean basin scale observing system in the region.

115 I-GOOS was encouraged to see the initiatives being taken to develop an IO-GOOS, and congratulated the IOC Regional Programme Office, Perth, on its efforts to take them forward with financial and material assistance of West Australia and the Commonwealth of Australia, and on the production of a comprehensive strategy document.

116 Seychelles indicated its interest in participating in GOOS developments in the Indian Ocean, and pointed to its recent involvement in the Mascarene Ridge Research Project as something that could perhaps be built upon in developing Indian Ocean GOOS pilot projects. Seychelles would be interested in participating in this and other observational projects in the region.

117 WIOMAP (Western Indian Ocean Marine Applications Project): Colin Summerhayes reported on the development of this project, which involves East African and western Indian Ocean island nations, and maps onto the IOCs Regional Committee for the Central and Western Indian ocean (IOCINCWIO). The co-proposers include: Comoros, France, Kenya, Mauritius, Mozambique, Reunion, Seychelles, South Africa, and Tanzania. The project aims to enhance coastal meteorological infrastructure and associated communication technology, and marine support activities to improve weather and marine resource predictions for the tropical West Indian Ocean and its monsoon circulation system. Much of the aim is to build regional capacity building to monitor and predict coastal impacts. A proposal has been written to attract funding for 5 years 2002-2006 (\$2.3 Million). It aims to extend human capacity through formal training; enhance communication infrastructure, expand the marine meteorological observing network, and improve management of project and product delivery.

118 I-GOOS was pleased to see the development of a proposal for funding WIOMAP activities, and invited the originators of the proposal to use the assistance of the GOOS Project Office in taking it forward.

Action: WIOMAP nations to use the services of the GPO as appropriate in taking forward the WIOMAP proposal.

119 GOOS-AFRICA: Justin Ahanhanzo (Technical Secretary of the GOOS-Africa Coordinating Committee) made a presentation on developments of GOOS in Africa. He reminded I-GOOS of the first meeting of the GOOS-AFRICA Committee at Maputo in July 1998. Attendees at the Mozambique meeting included: Algeria, Benin, Cameroon, Chad, Congo, Côte d'Ivoire, Egypt, Gabon, Ghana, Guinea, Kenya, Mauritius, Morocco, Mozambique, Nigeria, Senegal, South Africa, Tunisia, Zambia, Zimbabwe. Priorities agreed at ministerial level were: (i) enhancing sea-level measurements; (ii) enhancing access to and training in the interpretation and use of remotely sensed data from satellites; (iii) expanding the network of National Ocean Data Centres; and (iv) enhancing electronic communication and exchange of data. The latter two items are being addressed through the IOC's ODINAFRICA Project. The first two will be addressed through a GOOS-AFRICA workshop planned for Nairobi in November 2001. Like the MedGOOS meeting in Rabat in November 1999, the objective of the workshop will be to draft a proposal that can be addressed to funding agencies under the umbrella of the post-PACSICOM African Process, through which funding will be made available to address the priorities identified at the July 1998 meeting in Maputo. Several groups have expressed an interest in assisting with this meeting, including EUMETSAT. In parallel, the GOOS-AFRICA need for remote sensing has been used to underpin a funding proposal to UNESCO, which won \$400,000 for a 2-year project on capacity building related to the use of remote sensing in Africa, and education about the ways in which this data could be used in coastal regions. Justin Ahanhanzo is the programme manager for this project, for which we would be seeking external matching funds. In conclusion it was noted that GOOS could provide a tool for the implementation of aspects of Large Marine Ecosystem (LME) projects, which were now being funded in several places, including around Africa.

120 I-GOOS congratulated GOOS-AFRICA on these developments, and several Member States and EuroGOOS offered to help to take them forward. UNEP noted that it is keen to see GOOS efforts that will help with the implementation of the Abidjan and Nairobi Regional Seas Conventions. In that context it will be

keen to assist in the proposed workshop in Nairobi. I-GOOS noted the potential for GOOS to develop through association with LME projects.

Action: Member States, EuroGOOS and UNEP to consider ways in which they can help with the GOOS-
AFRICA workshop in Nairobi, November 2001.

Action: Member States and regional GOOS bodies to consider how they can interact with LME Projects as a
means of developing GOOS concepts and subsystems.

121 The International Ocean Institute noted that it was organizing a Pacem in Maribus conference in
Dakar, Senegal, November 5-10, 2001, to assist African countries in developing their strategies for Integrated
Coastal Zone Management, which will help in raising awareness about the benefits of developing coastal
GOOS in Africa.

122 NEAR-GOOS: Mr. Maarten Kuijper of the IOC's WESTPAC Office reported that the North-East
Asian Region GOOS Coordinating Committee was a subsidiary body of the IOC's Regional Sub-commission
for the western Pacific (WESTPAC), and so was intergovernmental in character, with members appointed by
Member States from China, Japan, Korea, and Russian Federation. In terms of UNEP's Regional Seas
programmes it mapped onto the Northwest Pacific Action Plan (NOWPAP). NEAR-GOOS had three
significant achievements. First was the establishment of an operational data sharing system through which
there had been a significant increase in data sharing between national and regional databases via the Internet.
Users were able to access the system free of charge, and a high level of interest was manifest from the 2000
visits per month on the central database. Second was the establishment of an annual training course on data
and information management. And third was the development of several NEAR-GOOS research projects,
especially in Japan and Korea.

123 NEAR-GOOS was now developing a strategic plan for the 2002-2007, which would consider how to
broaden NEAR-GOOS activities away from the successful base of data sharing and towards the incorporation
of biological and chemical data on the one hand, and the development of forecasting capabilities on the other
hand, so as to aid sustainable development. Both developments should attract more users. Both may require
changes to the composition of the Coordinating Committee to broaden the range of agencies involved as
members. To take forward the forecasting initiative, plans were in hand for a NEAR-GOOS ocean
environmental forecasting workshop to be held as part of the WESTPAC international scientific symposium in
Seoul in August 2001. Reflecting the interest of the biological community, this meeting will be co-sponsored
by the regional Pacific marine science and fisheries organization, PICES. Reflecting the interest in taking on
more environmental variables, so as to broaden the product range, NEAR-GOOS was working closely with
NOWPAP.

124 I-GOOS was much encouraged by these various developments, which reflected a similar kind of
evolution to that experienced within EuroGOOS.

125 SEA-GOOS (South-East Asia GOOS): Mr. Maarten Kuijper reported on the continuing consideration
of the development of SEA-GOOS by the Member States of WESTPAC. A SEA-GOOS Workshop was
planned for the WESTPAC Scientific Meeting, Seoul, August 2001. The Perth Office was assisting the
Bangkok Office in organizing it. The focus for the workshop would be on sub-regional projects targeting the
interests of small groups of neighbouring states in particular sea areas within the SEA-GOOS region, such as
the Gulf of Thailand for example. Projects might emerge focusing on such key issues as forecasting typhoons,
droughts, or the timing of onset of the monsoon. It was felt that this approach would help to avoid the
geopolitical problems likely to emerge in the creation of an overarching SEA-GOOS embracing all ocean
areas. Taking GOOS forward in the region would not be easy, recognizing that most countries there do not
even have national oceanographic data centres.

126 Within this area several countries have been brought together by WMO and the IOC to develop a
project proposal to ASEAN organization for funding a South-east Asia Centre for Atmospheric and Marine
Prediction (SEACAMP). The attendees at the initial SEACAMP meeting included: Australia, Indonesia,
Malaysia, Philippines, Singapore, Thailand, and Vietnam.

127 UNEP's East Asian Seas Coordination Unit is interested in cooperating with IOC in the development of SEA-GOOS. In this context, US\$32 million has been invested in a South China Sea project funded by the Global Environmental Facility (GEF) of the World Bank, which provides a platform on which to think of building the initial elements of a regional GOOS.

128 I-GOOS was interested to see the developments considered for this region.

Action: I-GOOS recommended that IOC's WESTPAC Office arrange for talks on GOOS to be given during the Oceanology International meetings in Singapore.

129 PacificGOOS: Mr. Alf Simpson, Director of SOPAC, in Fiji, gave a presentation on PacificGOOS, which is based on a Memorandum of Understanding (MoU) between the IOC and the South Pacific Geosciences Commission (SOPAC) representing all South West Pacific island states, including Australia and New Zealand, and therefore has the character of an intergovernmental organization. Attendees at the initial PacificGOOS meeting in February 1998 included representatives from Australia, Cook Islands, Fiji, Niue, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, and Tonga, as well as France, Netherlands, UK and USA. He suggested that given the large geographic extent of the Exclusive Economic Zones covered by the islands, they should in future be referred to as Large Ocean Island States rather than (as they had been referred to in the past) Small Island Developing States. It was noted that PacificGOOS maps onto UNEP's South Pacific Region Environment Programme, SPREP, which is part of the Regional Seas Programme.

130 The PacificGOOS Steering Committee had commissioned a consultant to draft a Strategic Plan that should be available as a first draft within a few days. Access to the MAMA proposal would help to refine the strategy. It was intended to develop PacificGOOS to the point where its operational components could be implemented by 2004. PacificGOOS had organized two workshops, the most recent being in Apia in August 2000, where four pilot projects were initiated. The IOC Regional Programme Office, Perth, was assisting in these developments, with the help of an *ad hoc* Secretariat provided by SOPAC. Both PacificGOOS and SOPAC were helping to facilitate the implementation of the Argo float project in the region. Furthermore they had assisted considerably with the launch of the SEREAD project described under agenda item 7.

131 I-GOOS was pleased to see the positive way in which PacificGOOS was developing, and thanked SOPAC for its assistance in providing the *ad hoc* Secretariat and other resources. The Committee recognized that PacificGOOS would need seed money to help it to find its feet and noted that the IOC and other donors had supported the two PacificGOOS workshops.

132 Finland noted that it was planning aid programmes in meteorology for Pacific and Caribbean island states.

Action: GPO to liaise with Finland on their meteorological projects in the Caribbean and the Pacific islands.

133 S.E. Pacific GOOS activities: Colin Summerhayes introduced this item by reminding participants that the IOC had a Memorandum of Understanding (MoU) with the Permanent Commission for the South Pacific (CPPS), the body set up to facilitate marine science interactions and cooperation between the nations of Chile, Colombia, Ecuador, and Peru. Mr. Fabien Valdivieso Eguiguren, Secretary-General of CPPS, informed delegates about the activities and responsibilities of the CPPS.

134 The CPPS was the Regional Coordinator for part of UNEP's Regional Seas Programme, the Plan of Action for the Protection of the Marine Environment and Coastal Areas of the South East Pacific, which falls under the Lima Convention.

135 I-GOOS-IV had recognized that increased cooperation between IOC and CPPS would be beneficial to both organizations, particularly with regard to the development of GOOS in the region, and decided to explore the possibility that the CPPS agreement with IOC be complemented by a special arrangement, specifying the contribution of CPPS to GOOS development, including national CPPS contributions. This was

endorsed by the IOC Assembly in Resolution IOC-XX-10, which called on the Director of the GOOS Project Office or his representative to liaise with an appropriate delegate of the CPPS, together to stimulate the development of GOOS in the southeastern Pacific, using the mechanism offered by the existence of the Joint IOC/WMO/CPPS Working Group on El Nino. Ultimately the intention would be to develop a regional southeast Pacific observing system based on the GOOS design and following GOOS principles. Mr. Summerhayes noted that progress had been made. An Annex had been drafted to add to the IOC-CPPS MoU, so as to cover the proposed interactions in the context of GOOS as required by the Resolution, and was now being considered by the CPPS. In addition, the former Coastal GOOS Panel had proposed as part of the Coastal GOOS design plan a pilot project along the west coast of South America to collect information from buoys and tide gauges so as to monitor the transfer of major central Pacific events down the South American coast, as the basis for forecasting local oceanographic effects on the environment. The outline plan for the project was published on the GOOS web site in the C-GOOS strategic design plan.

136 Peru and Chile noted that their coastal waters are now becoming instrumented with oceanographic platforms that could form the basis for a regional GOOS. A common Peru-Chile sea-level network is developing under the aegis of the CPPS, following GOOS principles.

137 I-GOOS noted these developments with interest, and looked forward to seeing further developments towards the establishment of a regional GOOS emerging from the interactions between the IOC (GPO) and CPPS.

138 EuroGOOS: Mr. Nic Flemming, Director of the EuroGOOS Office, reported that EuroGOOS was a self-funded association of 31 agencies from 16 countries, that were signatory to a binding MoU between themselves. The countries involved were: Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Netherlands, Norway, Poland, Russian Federation, Spain, Sweden, Turkey, and the UK. EuroGOOS has made substantial progress toward, and indeed commonly gone beyond, the goals set out in its original plan. Challenging new plans were now being developed for the next decade. These included an expanded list of forecast variables, including nutrients, water quality, and ecosystem parameters, as well as significant improvements in operational oceanographic models and services. To take forward the development of biological and ecological observing systems, models and forecasts, EuroGOOS had held a bio-ecological workshop jointly with ICES.

139 Operational oceanographic systems (OOS) had now begun to emerge, the first being the Baltic OOS (BOOS), which served the needs of the Helsinki Commission (HELCOM). A similar OOS was now emerging for the Northwest shelf. The Northwest shelf OOS (NOOS) would include coverage of the North Sea. EuroGOOS was planning with ICES and the Oslo-Paris Commission (OSPAR) a workshop in Bergen (September 2001) to consider an ecosystem-based approach to environmental and fisheries management in the North Sea, which would enable environmental and fisheries organizations to capitalize on the development of NOOS. The results of the workshop were expected to produce guidelines for the conference of North Sea Ministers in 2002.

140 EuroGOOS had become an operational organization supported by an infrastructure of cross-cutting components and services. In the future it was possible that EuroGOOS might become intergovernmental, but a great deal of work would be needed to demonstrate to governments the necessity of coordinating operational oceanography at the ministerial level, or formally appointing a national lead agency. For the time being, the inter-agency approach is practical and effective.

141 Many EuroGOOS data products were now available on the Internet home pages of the members or the regional task teams (for the Baltic, Northwest Shelf, Mediterranean, Arctic, and Atlantic). For information see EuroGOOS.org. EuroGOOS has developed a data policy. EuroGOOS has also developed with EUMETSAT a policy for European satellite missions in support of ocean data collection. EuroGOOS has also developed a link to regional hydrographic offices so as to assure the supply of appropriate bathymetric data for ocean models.

142 EuroGOOS realized that it had a responsibility for capacity building, and expressed its willingness to work with developing countries. EuroGOOS had been called upon to assist the development of GOOS in both

the Mediterranean and Black Sea, and was working on a twinning arrangement with Black Sea GOOS. Members were invited to contact the EuroGOOS Office with suggestions for capacity building.

143 I-GOOS was much encouraged to see that operational observing systems were now emerging, that the scope of attention was expanding to include biological and chemical measurements, which would meet the needs of a wider range of potential users, and that EuroGOOS was already sharing its wealth of operational experience with other regional groups.

144 MedGOOS: Ms. Silvana Vallerga, Chair of MedGOOS, reported on developments in MedGOOS, which, like EuroGOOS, is an association of agencies. Agencies from many Mediterranean countries are now signatory to a binding MoU to develop and implement observing systems in the Mediterranean. In addition almost all Mediterranean countries participated in the MedGOOS meeting in Rabat in November 1999, and are partners in the European Commission EC) research proposal that emerged from it, including: Albania, Algeria, Bosnia, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Palestine Authority, Slovenia, Syria, Spain, Tunisia, Turkey. A MedGOOS Secretariat has been developed in Malta, hosted by the International Ocean Institute, Malta, and supported with funds from MedGOOS patrons.

145 The current focus of MedGOOS is on the implementation of the proposal for a 'Mediterranean network to Assess and Upgrade Monitoring and Forecasting Activities in the Basin' (MAMA), which was recently funded by the EC for 2.3 Million Euros. MAMA has the following objectives:

- To build the basin-wide network for ocean monitoring and forecasting, linking all the Mediterranean countries, broadening and strengthening the existing observing systems;
- To identify the gaps in the monitoring systems in the region and in the capability to measure, model and forecast the ecosystems, taking stock of current research, training and development projects and other initiatives;
- To build capacities for expertise in the setting up and running of observing platforms, in managing data, in modelling and forecasting the ecosystem;
- To design the initial observing and forecasting system, inter-comparing experiences and standardizing practices, towards the coordinated upgrading of the observing and forecasting capabilities in all Mediterranean countries;
- To raise awareness of the benefits of ocean forecasting at local, regional and global scales, involving stakeholders, and disseminate MAMA results and products.

146 These objectives will be met through the achievement of eight work packages.

147 I-GOOS was pleased to see the progress that had been made in developing MedGOOS since the first MedGOOS meeting in Malta in November 1997. The Committee agreed that the MAMA proposal, while specific to the Mediterranean, offered a good example of 'best practice' that others could follow in setting up a coordinated development of a regional component of GOOS.

Action: With the agreement of the MedGOOS Chair, the GPO was asked to copy the MAMA document to participants and others who might find it useful in setting up or improving upon a regional GOOS.

148 Black Sea-GOOS: Mr. Illkay Salihoglu, of Turkey, reported on the development of Black Sea GOOS, which involved Bulgaria, Georgia, Rumania, Russian Federation, Turkey, Ukraine. Like NEAR-GOOS and IOCARIBE-GOOS, Black Sea GOOS was being organized under the aegis of an IOC regional body – the Black Sea Regional Committee, and therefore could be considered to have an intergovernmental character. It had first been identified as a pilot project of that Committee by the IOC in June 1995, in Resolution IOC.XVIII-17. However, the first Black Sea GOOS meeting had not taken place until October 1999, in Albania, Bulgaria, where a start was made on identifying needs and customers. In addition some strategic planning for operational oceanography had been done for example in producing the BlackMARS document. At the second meeting of Black Sea GOOS (Poti, Georgia, May 2001) a draft MoU covering the constitution and management of Black Sea GOOS was approved. Black Sea GOOS will foster the development of operational oceanography in the Black Sea region, capitalizing on existing subsystems, and adopting best

practice from elsewhere, especially using advice from EuroGOOS and from the MedGOOS MAMA proposal. Strategic and implementation plans will be developed to achieve this aim, to identify the present observing systems, to fill gaps, to exploit ferry lines as repeat sections, to promote the building of an appropriate infrastructure (including institutions, instruments and equipment), and to build capacity. The management group will consider developing a MAMA-type thematic networking proposal for submission to the EC through the two eligible states, Bulgaria and Romania (the proposal has to be ready by October 2001).

149 I-GOOS welcomed these developments, and EuroGOOS, MedGOOS and several Member States offered assistance.

150 IOCARIBE-GOOS: Colin Summerhayes reported that the IOCARIBE-GOOS was a subsidiary body of the IOC's Regional Sub-commission for the wider Caribbean region (IOCARIBE), and so was intergovernmental in character, with members appointed by Member States. Attendees at the first IOCARIBE-GOOS meeting in Costa Rica in April 1999 included: Barbados, Belize, Brazil, Colombia, Costa Rica, Cuba, Martinique, Guatemala, Mexico, Netherlands, Puerto Rico, Trinidad and Tobago, UK, USA, and Venezuela. An *ad hoc* Advisory Group for IOCARIBE-GOOS had been formed to lay the groundwork for the development of IOCARIBE-GOOS. Members of the advisory group came from: Barbados, Costa Rica, Cuba, Mexico, Trinidad and Tobago, USA, and Venezuela. IOCARIBE-GOOS maps onto UNEP's regional seas environment programme for the Caribbean, which meets the needs of the Cartagena Convention.

151 The third session of the *ad hoc* advisory group for IOCARIBE-GOOS was held in Miami, USA. (April 2001), to develop the draft chapters of the strategic plan for IOCARIBE-GOOS. Part of this exercise involved developing Inventory of Existing Systems (*via* IOCARIBE-GOOS Secretariat, NOAA, Miami). Plans were being made to hold a regional workshop to develop pilot programmes (Late 2001/Early 2002). The Strategic Plan will be finalized for approval by IOCARIBE-VI (Mexico, 2002).

152 The advisory group organized a 'Caribbean Sea and Gulf of Mexico Regional GOOS Symposium' as a contribution to the Oceanology International (OI) 2001 Americas meeting, which was held on April 4th in association with the group's third session. The symposium was well attended and considerable interest was shown by participants in the development of IOCARIBE-GOOS. It is intended to publish the papers from this meeting in an appropriate journal.

153 I-GOOS endorsed the Caribbean developments.

154 The International Council for the Exploration of the Sea (ICES) and GOOS: Mr. Harry Dooley of the ICES Secretariat gave a presentation on ICES and its relation to GOOS, which was complemented by distribution of a small ICES brochure entitled 'GOOS and ICES: A Partnership and a Contribution to the Ecosystem Approach to Management', made mostly to explain to ICES members what GOOS was about and how ICES might benefit from being involved with it. He suggested that GOOS needs ICES as much as ICES needs GOOS. ICES encompassed some 2000 scientists working through around 200 institutes in 19 member countries. These organizations have been collecting oceanographic information as well as information on living resources, for 100 years, and all of it could be useful to GOOS. ICES had a number of expert science committees and advisory groups covering matters of interest to GOOS. The science committees are responsible for developing new approaches and technologies that could be useful to GOOS. The advisory bodies help ICES to provide scientific advice to ministers.

155 Because of its interest in the potential of GOOS for meeting ICES needs, and to explore how ICES and GOOS might interact, ICES had formed a Steering Group on GOOS. At the last session of I-GOOS it had been recommended that this group be jointly sponsored by the IOC, so as to ensure that it got the most appropriate advice on GOOS through the IOC. This recommendation had been endorsed by the IOC Assembly in Resolution IOC-XX-9. EuroGOOS and the GPO were nominated as members of the new Group, the ICES-IOC Steering Group on GOOS, which held its first meeting in Southampton in October 2000. The Southampton meeting agreed to hold a workshop in Bergen in September 2001 on operational oceanography for support of an ecosystem-based approach to the management of fisheries, focusing on the North Sea, where it is intended that a pilot project should be developed, building on and in association with EuroGOOS's Northwest Shelf Operational Oceanographic System (NOOS) and on ICES data. The workshop is being

organized jointly by EuroGOOS, ICES, the GPO (IOC) and OSPAR. The output should provide useful advice for the conference of North Sea ministers in 2002.

156 ICES had already offered the hydrographic/chemical data from the International Bottom Trawl Survey (IBTS) of the North Sea as part of the GOOS-IOS. It is considering how to make available other IBTS such data from the margins of Ireland, France, Spain and Portugal. The IBTS data would make a significant addition to regional hydrographic data holdings.

157 To take ICES-GOOS links forward it will be necessary to 'sell' the idea of GOOS within ICES, where the concept of free and open exchange of data in the GOOS sense may take a while to take root. The small brochure is intended to help this educational process.

158 I-GOOS noted these developments with interest, and welcomed the close association that had developed between ICES and GOOS. I-GOOS was particularly pleased to see the joint effort to build on NOOS within the North Sea. This experiment could demonstrate how the GOOS-ICES link might work to best advantage; if it worked well there, it might be expected to convince people to try it in other parts of the ICES area, or even further abroad. Some participants objected to the use of the term ICES-GOOS in one of the background documents to the meeting, since this made it appear that some new regional GOOS group was expected to develop. That is not in fact the intention.

Action: the IOC-ICES Steering Group on GOOS was asked to take on board the concern of I-GOOS that the term ICES-GOOS was misleading, and to search for an alternative.

Action: GPO to work with ICES to find a means of bringing the GOOS message to appropriate high level ICES meetings.

159 Reviewing all of the regional presentations, I-GOOS declared itself pleased with the spreading regional development of GOOS, and impressed with the enthusiasm for GOOS at the regional level. Creation of regional GOOS bodies had substantially increased the number of Member States engaged in GOOS. This was happening through three complementary mechanisms: (i) creation of subsidiary bodies within the intergovernmental structure of the IOC (NEAR-GOOS, IOCARIBE-GOOS, Black Sea GOOS, WIOMAP); (ii) creation of regional groups within alternative intergovernmental structures operating on behalf of IOC (PacificGOOS in SOPAC); and (iii) creation of regional associations (EuroGOOS, MedGOOS) in areas where there was no formal IOC structure. I-GOOS noted with approval that all groups were related closely to the regional intergovernmental structures of UNEP's Regional Seas Programme and its Conventions and Action Plans, or to pre-existing Conventions (EuroGOOS and OSPARCOM). I-GOOS agreed that this growth had been good for the overall development of GOOS. It was important that all groups obeyed certain basic rules and followed GOOS Principles, and that no new regional group formed without the approval of I-GOOS.

160 I-GOOS agreed that it would be useful to have the regional bodies come together once every two years, between formal I-GOOS meetings, among other things to explore common problems, to exchange ideas, and to learn from best practice. This could be seen as an alliance of the regional alliances, and would help to cement and enhance GOOS developments globally.

Action: I-GOOS officers and GPO to make arrangements for a biennial I-GOOS Regional Forum, to be held in a different region every other year.

161 I-GOOS warmly thanked Jan Stel, the former Chair of the *ad hoc* GOOS Capacity Building Panel, for his personal efforts over the years in building up several of the new regional GOOS bodies, especially in the Mediterranean, the Caribbean, and the S.W. Pacific.

162 I-GOOS asked the Director GPO to make all regional contact points readily available in an easily identifiable place on the GOOS web site.

5.4.3 National GOOS developments, commitments, and reporting

163 Colin Summerhayes noted that the GPO was working to create a network of GOOS national contacts to facilitate the dissemination of information about GOOS, to act as a medium for exchange of information between countries, and to act as a vehicle for spreading best practice. As a first step, all Member States had been contacted to determine whom their GOOS contact points were, so that this information could be put on the National Information page on the IOC's GOOS web site. As a second step, all IOC Member States had been invited to submit information about their national GOOS programmes and plans, using the template sent out with the letter of invitation to attend I-GOOS-V (Annex VI). The national plans will be posted on the National Information pages on the GOOS web site, so that Member States, I-GOOS, the GSC and the GPO could see who was doing what. This would provide a useful mechanism for assessing the growth of GOOS by national contributions. He reported that thus far national GOOS reports had been received from the following countries: Australia, Canada, Colombia, Croatia, Cuba, Ecuador, Finland, France, Georgia, Germany, Iceland, India, Italy, Japan, Mauritius, Netherlands, Poland, Korea (Republic of), Spain, Slovenia, Ukraine, UK, and USA. A hard copy of the reports was made available to attendees, for reference.

164 I-GOOS noted and endorsed progress.

Action: those Member States that had not yet submitted country reports were asked to do so soon.

6. DATA AND INFORMATION MANAGEMENT AND POLICY

6.1 OCEANOGRAPHIC DATA POLICY

165 Dr. McEwan reported on progress in the development of a data policy for the IOC. An initial meeting on Oceanographic Data Exchange Policy, by an *ad hoc* Working Group chaired by David Pugh (First Vice Chair of the IOC), had been held in Paris on May 15-17, 2000, to scope out the issues. Following the report of Dr. Pugh's *ad hoc* Working Group to the IOC Executive Council (20-30 June, 2000), an intersessional intergovernmental Working Group on IOC Oceanographic Data Exchange Policy had been formed under the chairmanship of Dr. McEwan to take this matter forward. This second group held its first meeting in Brussels (29-31 May, 2001), and reached consensus on the elements that should be included in any forthcoming data policy. However, elaboration of the policy itself would take further work. Decisions about future activities under this heading awaited the deliberations of the 21st IOC Assembly in July 2001.

166 I-GOOS noted this development, and the fact that Member States involved in GOOS were already participating in the Working Group, the outcome of which would have a significant impact on how GOOS would be carried out in future. The Chairman was complemented on how the Brussels meeting was run, and on identifying the elements that need to be addressed. Good progress was being made towards creation of a data policy for the IOC. Nevertheless, Member States were urged to ensure to the extent possible that the outcome of the Working Group's deliberations would be good for GOOS.

6.2 DATA AND INFORMATION MANAGEMENT

6.2.1 GOOS Data and Information Management Plan

167 Colin Summerhayes reported on progress in the development of a data and information management plan for GOOS referring to document I-GOOS-V/Inf.14. The Strategy and Plan is intended to be used for three main purposes:

- To form the basis of a review of the GOOS-IOS to bring the existing applications up to the standards established for GOOS end-to-end systems;
- To guide the development and implementation of new end-to-end systems as pilot projects are implemented and evolved into operational systems; and
- To be a source of information on all aspects of GOOS data and information management for both developers of new systems and for users requiring access to GOOS data and information.

168 The GOOS data and information management system will be a highly distributed system based on contributions by operational agencies, data centres, and research organizations, and covering physical, chemical, and biological observations made *in situ* and from satellites.

169 The strategy document provides:

- basic design information, guiding principles;
- typical responsibilities for data and information centres;
- a strategy for planning the development and implementation of the data and information systems for GOOS;
- practical guidance material;
- examples of successful systems that now exist;
- concept of an on-line single point of entry for data and information;
- concept for monitoring data flows and the success in meeting data management goals.

170 The focus is on 10 general categories of applications to be served by GOOS, reflecting user needs:

1. Operational marine coastal and ocean short-range forecasting and analysis;
2. Seasonal to inter-annual climate prediction;
3. Numerical weather prediction;
4. High quality procedures for climate products;
5. Biodiversity and habitat;
6. Natural and man-made hazards;
7. Environmental indices;
8. Fisheries productivity;
9. Satellite data processing systems;
10. Regional integrated systems.

171 It is expected that implementation would be accomplished in an iterative fashion by:

- connecting existing programmes *via* the GOOS-IOS;
- adding data and improved analyses and products identified by the science panels; and
- rationalizing and modifying the operation of the elements of the GOOS-IOS to conform to the guidance, standards, and strategies of the plan.

172 For each of the 10 areas, the strategy covers: inputs; input delivery requirements; and quality control/assembly requirements, etc.

173 The goal is a unified and centralized information services system that:

- connects these programmes and the participating data and science centres;
- provides information about and access to the programmes and observations *via* a single source - GOSIC;
- provides automated (or at least semi-automated) tracking for the data and information (to demonstrate that the system is working or if not where the problems lie); and
- calls for data coordinators to check system function etc.

174 Implementing the data and information management system cooperation with other international programmes and data management systems of IOC and WMO, and with ICSU and IODE on archiving practices and standards.

175 Capacity Building is required to develop under-pinning infrastructure, for example by creating national GOOS coordinating committees and national oceanographic data centres.

176 The latest information about the system is available on line *via* the Global Observing Systems Information Centre(GOSIC) (see below).

177 For the future, the strategy would be developed further through activities of the GOOS-IOS and pilot projects, and through work on advanced data management technologies as approved by the GSC. In this context, Prof Nowlin presented a brief report on the ocean data and information technology project being proposed by Neville Smith (chair of OOPC) and colleagues to examine the ways in which ocean data management could be improved. This initiative, which would involve academia, government agencies, and industry, was expected to lead to a conference like the OceanObs Conference, in 2003, to build consensus on the way forward.

178 I-GOOS considered the development of the GOOS data and information management strategy and plan to have been an important and necessary step, congratulated the author of the plan (Mr. Ron Wilson), commended the involvement of industry in the proposed ocean data and information technology pilot project, and looked forward to seeing the results in due course.

6.2.2 GOSIC

179 Bert Thompson reported on progress in the activities and plans for the global observing systems information centre (GOSIC), which is an on-line center that provides one-window access to the metadata for the three global observing systems GOOS, GCOS and GTOS (see www.gos.udel.edu). Through GOSIC users can view and link to the data centers containing elements of the GOOS-IOS. They can search the data set registry for historical and operational data. They can study the detailed end-to-end systems and link into them *via* the flow diagrams. And they can access the design and planning information about the observing system.

180 GOSIC was established by the three observing systems following recommendations from their Joint Data and Information Management Panel (J-DIMP) in 1997. It was established as a pilot project to develop methods for easy on-line access to the comprehensive base of data and information in GOOS, GCOS and GTOS. It was set up at the University of Delaware with funding from the NOAA and NASA.

181 GOSIC's performance has been evaluated by an external team appointed by GOOS, GCOS and GTOS, the report of which will soon be available. Similar reviews will take place annually. The review endorsed the way in which GOSIC is working, and provided some specific advice on improvements for the immediate future.

182 At the end of 2000, GOSIC completed its first three-year trial phase of development. As of June 1, 2001, a second three-year phase is being negotiated with NOAA. This will lead GOSIC to a position where it can be considered as operational and transferred to an operational center. GOSIC can assist countries in building a capability to distribute their information on global observations.

183 I-GOOS noted and endorsed the continued development of GOSIC towards operational status. I-GOOS recommended Members to visit the GOSIC Web Site and to provide the designer and operators with feedback as to how the system could be improved, and to inform their national agencies about the potential of GOSIC.

6.2.3 Links to IODE

184 Dr. Summerhayes reported on progress in the development of links between IODE and GOOS. These links have been strengthened in a variety of ways. IODE and GOOS held a meeting in March 2000 to discuss the metadata requirements of the GOOS programme, plan collaboration to meet these needs, and encourage the use of the MEDI software tool by GOSIC and NASA. IODE and GOOS jointly participated in the two JCOMM-transition meetings (July 1999 and June 2000), and in JCOMM-I (June 2001), and were successful in getting the chairmen of both IODE and the GSC appointed to the JCOMM Management Committee. The GOOS Project Office participated in the 16th session of the IODE in Portugal in November 2000, and IODE participated in the GOOS Steering Committee meeting (March 2001) and demonstrated MEDI. IODE's

development of ODINAFRICA is seen as meeting the requirement of GOOS-AFRICA for expanding NODCs in Africa. In addition, IODE-16 strengthened the involvement of IODE in GOOS in the following ways, by:

- noting the importance of increasing the participation of IODE centres in managing GOOS data;
- establishing a Steering Group to establish, maintain and strengthen IODE's participation in monitoring programmes relevant to GOOS;
- recognizing GOOS's needs to access biological and chemical data, and established an IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices to take this issue forward;
- establishing an Underway Sea Surface Salinity Data Archiving Pilot Project to meet OOPC needs.

185 I-GOOS was strongly supportive of the increasing linkage between GOOS and IODE. A concern was expressed that present data management arrangements are not at all well suited to handling the rapid and very large increase in the supply of real-time data needed for ocean monitoring and forecasting. Member States were urged to work with IODE to broaden the capabilities of IODE Data Centres to include an ability to handle real-time data.

7. CAPACITY BUILDING

7.1 STRATEGY AND PRINCIPLES

186 Prof. Nowlin introduced the GOOS Capacity Building (CB) strategy and principles, referring to document IOC-WMO-UNEP/I-GOOS-V/12, which is based on and contributes to IOC's TEMA programme. Recognizing that the regional implementation of GOOS, for example through regional pilot projects, demanded the building of scientific and technical capacity, the first meeting of the GOOS Steering Committee (April 1998) had called for the development of a strategy and guiding principles for GOOS CB. A draft GOOS CB Principles document was prepared for and approved by the second meeting of the GOOS Steering Committee (GSC-II, April 1999), and by I-GOOS-IV (June 1999), which agreed on the need for (i) a comprehensive CB strategy and principles (consistent with the IOC's TEMA programme), and (ii) the creation of a standing CB Panel to design and oversee implementation of the CB programme through the GSC, and to replace the former *ad hoc* panel.

187 Dr. Geoff Holland (Canada) agreed to chair the GOOS CB Panel, and Members were appointed following the guidance in the GOOS Principles draft. The final version of the GOOS CB Principles document was approved at GSC-III (May 2000), where Dr. Holland offered preliminary plans for the Panel, and tabled a draft Implementation Strategy. Prior to GSC-IV (March 2001), Dr. Holland found it necessary to resign, and Prof. Geoff Brundrit (S. Africa) agreed to chair the GOOS CB Panel. With the assistance of the GPO, Prof. Brundrit finalized the Implementation Strategy, which was approved at GSC-IV, and laid out a draft action plan. The Panel Membership was slightly revised. The CB Panel has worked until now by e-mail. A meeting has been provisionally scheduled for November 2001.

188 I-GOOS welcomed the finalization of the CB Principles and the development of the CB Implementation Strategy, and congratulated the authors on their production. Implementing the programme would require many different kinds of resources, not only money, but also things like manuals and guides and so on. European members pointed to the possibility of accessing EC funds for capacity building. I-GOOS would look to the GOOS CB Panel and to the regional GOOS bodies to be proactive in developing a comprehensive GOOS CB programme, in which consideration should be given to exploiting ongoing and new initiatives like the development of LME projects. I-GOOS endorsed the development of a workshop on Argo products that was being proposed for the Pacific region.

189 I-GOOS recommended the development of an *ad hoc* Intersessional Working Group on Resources to assist the GPO with advice on where resources might be found and on what further resources (handbooks and the like) were needed (without duplicating the work of the GOOS CB Panel).

7.2 PLANS

190 Dr. Summerhayes presented the plans for GOOS Capacity Building for 2001, referring to document IOC-WMO-UNEP/I-GOOS-V/13. He indicated that an outline plan for 2002 had already been approved by the GSC, along similar lines to the one for 2001, which tried to spread resources equitably between the different regions. New proposals for aid for capacity building through IOC channels should be compared against those already in the system, and ranked and judged through consultation with the GOOS-CB Panel and GSC Executive.

191 I-GOOS endorsed the plans for 2001. Although a Draft Resolution for PacificGOOS had been tabled during the present meeting, I-GOOS did not believe that any special attention should be drawn to the capacity building funding needs of particular regions at the IOC Assembly, because several of the new regional GOOS groups also needed such assistance and an outline CB programme had already been approved. I-GOOS agreed to recommend to the IOC as part of an overall GOOS Resolution the need for Member States to support capacity building activities to strengthen the regional development of GOOS. EuroGOOS offered to assist with capacity building if presented with appropriate proposals.

192 Members were asked to suggest to the GPO and GOOS CB Panel what elements, regions and priorities should be addressed in the capacity building programme in the short term (for 2002) and the medium to longer term (2002-2007).

193 Mr. Bill Erb of the IOC Regional Programme Office, Perth, presented a report on the SEREAD project (Scientific Educational Resources and Experience Associated with the Deployment of Argo Drifting Floats in the South Pacific Ocean). The object of the project was to get Pacific islands students, teachers, and communities talking about Argo and understanding more about environmental issues and the contribution of global observing systems to dealing with them. Essentially it would involve schools adopting and tracking Argo floats, in the context of an educational programme to teach them more about the major environmental issues that affect them. The project was due to start in February 2002, preceded by teacher training starting in September 2001. SEREAD was organized by a partnership involving the IOC, UNESCO, the IOI, SOPAC, NIWA and SIO.

194 I-GOOS encouraged Member States to assist in the development of the SEREAD concept, and urged other regions to consider adopting similar approaches to raise awareness about the importance of ocean observations.

8. LIAISON AND INTEGRATION

8.1 GCOS, GTOS

195 The Directors of the Secretariats for GCOS and GTOS will briefly report on progress in the development of their programmes in the context of their linkages with GOOS.

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

196 In terms of Conventions, Dr. Summerhayes explained that there was a very strong link between the OOPC and the UN Framework Convention on Climate Change, with the OOPC advising GCOS on the requirements for ocean observations for climate, and GCOS integrating that into overall advice to the Conference of the Parties to the UNFCCC. The COP has asked Member States to submit Action Plan indicating how they propose to meet the requirements specified for the UNFCCC by GCOS. The COOP was considering the relationship of the coastal design to other conventions like the Ramsar Convention on Wetlands, the Global Plan of Action for the Protection of the Marine Environment from Land-based Activities (GPA-LBA), and the Straddling Stocks Convention. The primary Conventions and Action Plans relevant to the work of COOP were those of the UNEP Regional Seas Programme (RSP). In that context (see below) GOOS was developing a much closer link to the RSP. GOOS was also linked to FAO, through its co-sponsorship of COOP (and, formerly, of the Living Marine Resources Panel).

197 Mr. Ellik Adler, of UNEP's Regional Seas Programme, made a presentation on the programme and its relation to GOOS. The RSP began in 1974, and now comprises 17 RSPs involving 140 countries. The RSP may serve as a platform for regional implementation of global conventions as well as regional implementation of global programmes. In this context, GOOS could be seen as a tool for achieving the goals of the RSPs.

198 The Conventions of the RSP aim to protect and preserve the marine environment by preventing, reducing and abating pollution, by preserving rare and fragile ecosystems and habitats, and by managing the marine ecosystem in a sustainable way. They contain an obligation for scientific and technological cooperation on research and monitoring. There are five basic components to each:

- Environmental Assessment (to assist policy makers in);
- Environmental Management;
- Environmental Legislation (from regional or global to national level);
- Institutional Arrangements (RCU, RACs, governing bodies);
- Financial Arrangements (contributions, trust fund).

199 In each region there is a focus on the following three elements:

- Promotion of Integrated Management and Sustainable Development of coastal areas and associated river basins and their aquatic resources;
- Promotion of implementation of appropriate Technical, Institutional, Administrative and Legal Measures for improved protection of the coastal and marine environment;
- Facilitating assessments of the coastal and marine environment including their conditions and trends.

200 In order to make the best use of GOOS in the context of the RSPs, and the best use of RSPs in the context of GOOS, we need (i) to enhance mutual awareness and knowledge of parallel activities; (ii) to enhance exposure of GOOS to RSPs; (iii) to create a formal link between the two programmes, by means of a MoU; (iv) to develop projects of mutual interest to prevent duplication.

201 Cooperation is already established for the Mediterranean and East Asia (*via* WESTPAC), and is being explored for the Caribbean and for the Northwest Pacific (NOWPAP). It would now be useful to focus attention in addition on the Nairobi and Abidjan Conventions, which cover respectively the eastern and western margins of Africa, on the South-east Pacific (through the CPPS), and, if possible, in the context of the development of GOOS in the Indian Ocean, on South Asia.

202 It was pointed out that to ensure the success of scientific and technical programmes within the RSPs, UNEP encouraged the development of Regional Activity Centers (RACs). It would be worth considering the establishment of joint GOOS-UNEP RACs. Given that GOOS was currently working with ICES on an ecosystem-based approach to fisheries management, it would also be worthwhile integrating GOOS scientific input into the UNEP/FAO initiative on Eco-based Management of Fisheries.

203 Finally, it would seem appropriate to inform each other's General Assembly (UNEP's Governing Council) on progress made on mutual work and cooperation. At the third meeting of the RSPs, in Monaco in November 2000, the recommendation had been accepted that GOOS and the RSP should work closely together in future. This recommendation had then been endorsed by the UNEP Governing Council. Mr. Adler noted that he would be making much the same presentation to the IOC Assembly and suggested that it might be worth tabling a Resolution recommending the joint approaches mentioned here.

204 I-GOOS thanked Mr. Adler for his interesting and stimulating presentation. Participants commented that the involvement of a substantial number of RSP representatives in the meeting was a significant and positive new development. It showed that there was a strong belief in the real potential for using regional GOOS bodies as tools to meet RSP requirements, something that was already being practically demonstrated by the work of BOOS for HELCOM in the Baltic. The GOOS concept, which had come on the scene subsequent to the creation of the RSP concept, offered the RSPs mechanisms through which issues like pollution, habitat degradation, and sustainable development could be addressed in the context of the physical characteristics and dynamics of the environment.

8.3 ICSU, WCRP, IGBP, POGO

205 Dr. Summerhayes noted that GOOS was linked to ICSU through ICSU's co-sponsorship of the GSC, and through the use of ICSU's SCOR as a source of advice on the membership of the GSC and its subsidiary bodies. He noted that links with CLIVAR, a major project of the WCRP, had already been addressed in passing by Prof. Nowlin and Mr. Uwe Send, and that these were cemented naturally by the joint sponsorship of the OOPVC by both GOOS and the WCRP (not to mention GCOS). Links with the IGBP took place mainly through the COOP, which had strong links to the IGBP projects LOICZ and GLOBEC, members of which attended COOP meetings.

206 POGO (the Partnership for Observations of the Global Ocean) is a new animal, created since the last session of I-GOOS. It is an international network of major oceanographic institutions, linking those institutions that are capable of conducting global and basin scale investigations and measurements, and that can therefore contribute to many of the activities of GOOS. The partnership enables the directors of the member institutions to meet and consult with the academic and research institutions, scientific advisory bodies, operational agencies, non-governmental agencies and GOOS. This dialogue fosters collaboration and consensus building. The Partnership aims to demonstrate that it meets the need for better coordination of ocean studies. It seeks opportunities to combine the resources of its members to enhance education and public outreach programmes that enhance awareness of the importance of the oceans in global systems. Recently, POGO in collaboration with the IOC and SCOR has launched a Fellowship programme. Resources are available this year for 10 POGO Fellowships.

207 I-GOOS strongly endorsed the development of POGO, and especially the Fellowship programme, which could be seen as contributing to GOOS capacity building. Members were asked to assist in implementing the POGO Fellowship programme.

9. GOOS INFRASTRUCTURE

9.1 REPORT OF THE GOOS PROJECT OFFICE (GPO)

208 I-GOOS noted with interest the increasing decentralization of Secretariat activities, with the IOC Regional Programme Office (for GOOS), in Perth, Australia, having been very active; the WESTPAC Secretariat, in Bangkok, continuing to take responsibility for NEAR-GOOS and SEA-GOOS; and the development of regional Secretariats in Malta (MedGOOS), Miami (IOCARIBE-GOOS), and Fiji (SOPAC Secretariat for PacificGOOS). It was gratifying to see that GPO staff support increased by 14% in the past year. I-GOOS thanked Japan, USA and Brazil for staff secondments to the GPO, and the USA for financial support of contract staff.

9.2 COMMUNICATION AND INFORMATION (incl. Handbook)

209 I-GOOS noted a number of improvements in communicating GOOS to the wider world. The GOOS Web Site had been substantially upgraded. The number of visits to the site had increased from 100 per week in 1999 to 300+ per week this year. The GOOS News was being produced at the rate of 2 per year. The first issue of a GOOS Products and Services Bulletin was published on the GOOS web site. A GOOS brochure was now in draft form. In addition, GOOS would feature in an IGOS Partners brochure that was due to appear soon, and in a poster display that the IGOS Partners would take to the global environmental conference in Amsterdam in August 2001.

9.3 FUNDING

210 I-GOOS noted with satisfaction that the funds for GOOS had increased around 50% from \$660,000 in 1999 to \$905,000 in 2001, and that 36% of present funding came from extra-budgetary sources rather than from the UNESCO Regular Programme. Over the 2 years since I-GOOS-IV, expenditure had increased 50% on implementation and 100% on capacity building, and decreased about 20% on planning.

9.4 FUTURE ACTIVITIES OF THE GOOS STEERING COMMITTEE

211 The Chairman invited discussion on the activities and plans of the GSC.

212 There was no discussion, this item having been dealt with effectively within other agenda items, so it is suggested that it be deleted from the record of the meeting.

10. REVIEW OF ACTIONS AND ISSUES

10.1 ACTIONS FOR 1999-2001

213 Colin Summerhayes reviewed progress against actions for 1999-2001, referring to document IOC-WMO-UNEP/I-GOOS-V/16. I-GOOS considered that the business of its last session had been dealt with appropriately and adequately in the intersessional period.

10.2 REVIEW OF MAJOR ISSUES FOR 2001-2003

214 The Sessional Working Group on 'Issues 2002-2007' recommended that during the next intersessional period I-GOOS should focus on a limited number of major issues that had already been discussed at length during the session:

- (i) ***Regional GOOS development should be the first priority.*** The regional approach was the way to promote and implement GOOS. A certain degree of freedom was accepted for establishing regional bodies. Technical coherence between the various regional approaches required GOOS to produce requirements and technical guidelines for developing, implementing and running the observing systems. Difference should be accepted between GOOS regional alliances based on agencies grouping together to regionally implement in a comprehensive way, and those covering the implementation of a specific observing system, or pilot project, or activity covered by a body like JCOMM.
- (ii) ***Identify and convince new governmental and/or non-governmental resource providers to support the developments of the operational system.*** This supposes a "marketing approach", based on the illustration of the usefulness of GOOS through significant global, regional and national examples of benefit (micro-economic rather than macro-economic). This process could be achieved by means of a GOOS Consensus Conference.
- (iii) ***Start transferring the GOOS Initial Observing System into the GOOS Observing System.*** Here what is needed is the finalization and wide dissemination (especially to operational agencies of governments) of GOOS requirements so that a rolling process of review could be initiated as the basis for comparing achievements with requirements. As the requirements for Climate are known, most of the effort is required on the Coastal requirements. A part of this task is to define and establish the working relations with J-COMM or any other similar body to be established.
- (iv) All the above require ***increased visibility of GOOS by governments, and promotion of GOOS to governments.*** In turn, this called for the creation within Member states of "GOOS Focal Points" able to represent the full spectrum of national oceanographic activity.

215 I-GOOS thanked the Working Group on producing a pragmatic vision for the future, and observed that the challenges were substantial and would take some time to address fully. I-GOOS noted that there was good agreement between this report and that of the Sessional Working on Structure, and agreed that its new management mechanisms, working together with the GSC and GPO, should address these important issues as a matter of high priority, and report on progress to I-GOOS-VI. It was agreed that it was not up to I-GOOS to define the requirements, but to endorse those emerging from the scientific and technical advisory bodies (OOPC and COOP). Nevertheless, I-GOOS could play a useful role in disseminating the requirements at national and regional level.

10.3 ACTIONS FOR 2001-2003

216 The following substantial recommendations were approved for the period 2001-2003, based on the results of the meeting:

- (i) **A new formal management structure for I-GOOS should be created comprising an I-GOOS Board or Bureau.** This should consist of the I-GOOS Officers, be staffed by the Director GPO, and have (as yet undefined) links to the regional GOOS bodies. The Chair of the GSC should be an ex-officio member of the structure. The final form of the I-GOOS management structure for the period would be decided by the I-GOOS Officers following the meeting. Provision should be made for continuance of the function of a GOOS Executive, as defined in the Structure paper, bringing together the Chairs of I-GOOS and the GSC. In any case, the chairs of I-GOOS and the GSC would also continue to work together through their joint participation in the Executive Committee of the GOOS Steering Committee, which comprised the Chair, Vice-chair, and one Member of the GSC, plus the Chair of I-GOOS and the Director of the GPO.
- (ii) **A set of *ad hoc* Intersessional Working Groups should be created to enable I-GOOS to carry out its business.** These would comprise:
 - A Visibility Group: to communicate the GOOS message to policy makers;
 - A Rio + 10 Group: to consider how to convey the message about GOOS to the World Summit on Sustainable Development (e.g. *via* the UN agencies, *via* the G8, and *via* individual Member States);
 - A Resources Group: to advise the GPO and I-GOOS how to increase support for GOOS activities, development, and capacity building;
 - A GOOS Review Group: to assist the GPO in planning and executing the independent external review of the structure of GOOS proposed for 2002;
 - A Structure Statement Group: to simplify the statement on the structure, mandates and *modus operandi* of GOOS for the benefit of policy makers;
 - A Regional Policy Group: to further develop, improve and finalize the draft of the regional policy document.

For the most part these groups would be small, short-lived, and work by e-mail.

The Chairman of the GSC noted that the GSC was preparing a 10-year plan of scientific and technical activities, which could be of help to the Review Group. He asked if the Review Group could be requested to look more broadly than the structure, to see if our plans are reasonable and to comment on the extent to which we are making progress. IOI, in its role as an independent NGO, offered to help with the Review.

- (iii) **A review of GOOS focusing on the structure, mandates and *modus operandi*, should be held during 2002 with the object of reporting to the 22nd IOC Assembly** (see Resolution in Annex V).
- (iv) **A Regional GOOS Forum should be held every second year between the biennial I-GOOS meetings.**

217 The Chairman was asked to take these recommendations and the Resolution to the 21st session of the IOC Assembly (the week following I-GOOS-IV), along with the following additional recommendations: (note that draft resolutions on other topics were converted into recommendations, at the request of the Assembly):

- (v) **that the IOC Assembly bring to the World Summit on Sustainable Development a statement on the importance of GOOS as a tool to facilitate sustainable development;**
- (vi) **that Member States should support implementation of GOOS in coastal waters following the publication of design advice by COOP;**

- (vii) **that Member States should support the capacity building activities of the regional GOOS bodies as they sought to develop and implement GOOS in their coastal waters and Exclusive Economic Zones;**
- (viii) **that the IOC should urge Member States to make the Ocean Theme document widely known as a blueprint for action in respect of the requirement for space-based observations and their integration with *in situ* ocean observations;**
- (ix) **that the IOC should encourage Member States with interests in GOOS (i) to form National GOOS Coordinating Committees representing all key stakeholders, and (ii) to ensure that the national representatives selected to attend I-GOOS represent the interests of a broad range of operational agencies and users of GOOS products;**

218 In addition the following list of actions were identified:

1. I-GOOS invited all Member States to contribute to the funding for the Argo Coordinator's position;
2. Members were invited to suggest appropriately technically qualified candidates for JCOMM working groups;
3. The GSC Chair, through his position on the JCOMM Management Committee, was asked to keep a watching brief on JCOMM developments and to ensure to the extent possible that such developments were consistent with the interests of I-GOOS. In addition, the Chairs of COOP would be asked to work with the JCOMM Rapporteur appointed to investigate COOP requirements for the JCOMM Management Committee;
4. WIOMAP nations to use the services of the GPO as appropriate in taking forward the WIOMAP proposal;
5. Member States, EuroGOOS and UNEP to consider ways in which they can help with the GOOS-AFRICA workshop in Nairobi, November 2001;
6. Member States and regional GOOS bodies to consider how they can interact with LME Projects as a means of developing GOOS concepts and subsystems;
7. IOC's WESTPAC Office should arrange for talks on GOOS to be given during the Oceanology International meetings in Singapore;
8. GPO to liaise with Finland on their meteorological projects in the Caribbean and the Pacific islands;
9. With the agreement of the MedGOOS Chair, the GPO was asked to copy the MAMA document (on a "Mediterranean network to Assess and upgrade the Monitoring and forecasting Activity in the basin") to participants and others who might find it useful in setting up or improving upon a regional GOOS;
10. The IOC-ICES Steering Group on GOOS was asked to take on board the concern of I-GOOS that the term ICES-GOOS was misleading, and to search for an alternative;
11. GPO to work with ICES to find a means of bringing the GOOS message to appropriate high-level ICES meetings;
12. I-GOOS officers and GPO to make arrangements for a biennial I-GOOS Regional *Forum*, to be held in a different region every other year;

13. I-GOOS asked the Director GPO to make all regional contact points readily available in an easily identifiable place on the GOOS Web site;
14. Those Member States that had not yet submitted country reports were asked to do so soon;
15. I-GOOS-VI should be held 3 months before the next IOC Assembly in 2003 so as to allow time for I-GOOS advice to the Assembly to be prepared and disseminated in advance of the Assembly;
16. I-GOOS Members are asked to visit the GOSIC Web site, to provide the designer and operators with feedback as to how the system could be improved, and to inform their national agencies about the potential of GOSIC;
17. Members were asked to assist in implementing the POGO Fellowship programme;
18. Members were asked to suggest to the GPO and GOOS CB Panel what elements, regions and priorities should be addressed in the capacity building programme in the short term (for 2002) and the medium to longer term (2002-2007).

11. ELECTION OF CHAIRMAN AND VICE-CHAIRMEN

219 I-GOOS accepted the report of the Nominations Committee. The goal had been to name experts for
the position of I-GOOS Chair and two Vice Chairs so that (i) strong and wise leadership of I-GOOS is
continued; (ii) regional representation is not uneven; corporate memory and experience of I-GOOS activities
are in place; there is general support for and no strong reservations about the individual candidates.

220 Ms. Silvana Vallergera (Italy) was elected Chairperson.

221 Mr. Rodrigo Nunez and Ms. Janice Trotte were elected Vice-Chairpersons.

222 All nominees expressed their agreement to accept the positions.

223 The Nominations Committee noted that the composition of I-GOOS represents even geographical
distribution if it is seen not from the point of view of continents, but from the point of view of oceans.

224 The Netherlands recording its abstention from voting.

225 I-GOOS warmly welcomed the three incoming candidates, and gave a special vote of thanks to
Dr. Angus McEwan, the outgoing chair, for the exemplary way in which he had discharged his duties and for
his wise advice to the GPO.

12. NEXT SESSION OF THE IOC-WMO-UNEP COMMITTEE FOR GOOS (I-GOOS-VI)

226 The Committee agreed that its next session, in Paris, should be held 3 months before the next IOC
Assembly in 2003 so as to allow time for I-GOOS advice to the Assembly to be prepared and disseminated in
advance of the Assembly.

13. CLOSURE OF THE SESSION

227 The draft summary report of the session, as prepared by the GPO, will be reviewed by the
Rapporteur and the GOOS Officers within two months after the end of the session, and the final version of the
report will be forwarded to all participants as soon as possible thereafter, and prior to translation and
publication.

228 The fifth session closed at 6.00 pm on the afternoon of Saturday June 30th 2001.

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. **THE STRUCTURE, MANDATES AND *MODUS OPERANDI* OF GOOS**
4. **STATUS OF GOOS PLANNING**
 - 4.1 THE GOOS STEERING COMMITTEE
 - 4.2 THE OPEN OCEAN: OOPC AND OCEANOBS' 99
 - 4.3 THE COASTAL OCEAN: C-GOOS, LMR, HOTO AND COOP
 - 4.4 INTERACTION WITH USERS: THE FIRST GOOS USERS' FORUM
 - 4.5 THE OCEANS THEME AND THE CARBON THEME OF THE IGOS PARTNERS
5. **STATUS OF GOOS IMPLEMENTATION**
 - 5.1 THE GOOS INITIAL OBSERVING SYSTEM
 - 5.2 GODAE AND ARGO
 - 5.3 JCOMM
 - 5.4 REGIONAL AND NATIONAL GOOS IMPLEMENTATION
 - 5.4.1 **Regional GOOS policy**
 - 5.4.2 **Regional GOOS activities**
 - 5.4.3 **National GOOS developments and commitments**
 - 5.4.4 **National GOOS reporting (résumé only – national reports will be written, not oral)**
6. **DATA AND INFORMATION MANAGEMENT AND POLICY**
 - 6.1 OCEANOGRAPHIC DATA POLICY
 - 6.2 DATA AND INFORMATION MANAGEMENT
 - 6.2.1 **GOOS Data and Information Management Plan**
 - 6.2.2 **GOSIC**
 - 6.2.3 **Links to IODE**
7. **CAPACITY BUILDING**
 - 7.1 STRATEGY AND PRINCIPLES
 - 7.2 PLANS
8. **LIAISON AND INTEGRATION**
 - 8.1 GCOS, GTOS
 - 8.2 UN (Conventions, UNEP Regional Seas, IOC, FAO Regional Programmes)
 - 8.3 ICSU, WCRP, IGBP, POGO
9. **GOOS INFRASTRUCTURE**
 - 9.1 REPORT OF THE GOOS PROJECT OFFICE
 - 9.2 COMMUNICATION AND INFORMATION (inc. Handbook)
 - 9.3 FUNDING
 - 9.4 FUTURE ACTIVITIES OF THE GOOS STEERING COMMITTEE

10. REVIEW OF ACTIONS AND ISSUES

10.1 ACTIONS FOR 1999-2001

10.2 REVIEW OF MAJOR ISSUES FOR 2001-2003

10.3 ACTIONS FOR 2001-2003

11. ELECTION OF CHAIRMAN AND VICE-CHAIRMEN

12. NEXT SESSION OF THE IOC-WMO-UNEP COMMITTEE FOR GOOS (I-GOOS-VI)

13. CLOSURE OF THE SESSION

ANNEX II

LIST OF DOCUMENTS*

Document Code	Title	Agenda Items	Lang.
WORKING DOCUMENTS			
I-GOOS-V/1 prov.	Provisional Agenda	2.1	E F S R
I-GOOS-V/1 Add.prov.	Provisional Timetable	--	E only
I-GOOS-V/ 2	Annotated Provisional Agenda	--	E F S R
I-GOOS-V/ 3	Summary Report of the Session (to be prepared during or after the Session)	--	
I-GOOS-V/ 4 prov.	Provisional List of Documents (this document)	2.3	
I-GOOS-V/ 5 prov.	Provisional List of Participants (to be issued early during the Session)	--	
I-GOOS-V/ 6	The Structure, Mandates and Modus Operandi of GOOS	3	E only
I-GOOS-V/ 7	The GOOS Initial Observing System	5.1	E only
I-GOOS-V/ 8 & 9	The Global Ocean Data Assimilation Experiment & Argo	5.2	E only
I-GOOS-V/ 8 & 9 sup.1	The Argo Information Centre	5.2	E only
I-GOOS-V/ 8 & 9 sup.2	Outcome of ABE-LOS meeting regarding Argo	5.2	E only
I-GOOS-V/10	Regional Policy for GOOS	5.4.1	E only
I-GOOS-V/10A	An Indian Ocean Observing Strategy	5.4.2	E only
I-GOOS-V/11	Table of National Contact Points for GOOS (updated 26 Ap. 2001)	5.4.3	E only
I-GOOS-V/12	The GOOS Capacity Building Principles (IOC/INF-1158 – GOOS Rep. No. 69)	7.1	E only
I-GOOS-V/13	The GOOS Capacity Building Plans (final version) (IOC/INF-1160 – GOOS Rep. No. 106)	7.2	E only
I-GOOS-V/ 14	Report by the Director GPO	9.1	E only
I-GOOS-V/ 15	Draft GOOS Brochure	9.2	E only
I-GOOS-V/16	Report on Actions from I-GOOS-IV	all & 10.1	E only
INFORMATION AND OTHER REFERENCE DOCUMENTS			
I-GOOS-V/Inf.1	Relevant Actions and Resolutions from IOC-XX	all & 10.1	E only
I-GOOS-V/Inf.2	Relevant Actions and Resolutions from IOC-EC-33	all & 10.1	E only
GOOS Report No. 72	Report of 4 th Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (I-GOOS-IV)	all	E/F/S/R
GOOS Report No. 97	Draft Status Report on Existing Ocean Elements and Related Systems (April 2001)	all	E only
GOOS Report No. 87	Report of 3 rd session of GOOS Steering Committee (GSC-III)	4.1	E only
GOOS Report No. 102	Report of 4 th session of GOOS Steering Committee (GSC-IV)	4.1	E only
GOOS Report No. 98	Report of the 5 th session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC-V)	4.2	E only

* This list is for reference only. No stocks of these documents are maintained.

Document Code	Title	Agenda Items	Lang.
I-GOOS-V/Inf.3	OceanObs 99 Conference Statement	4.2	E only
GOOS Report No. 91	Report of the 4 th session of the GOOS Living Marine Resources (LMR-IV) Panel	4.3	E only
GOOS Report No. 86	Report of the 5 th session of the GOOS Coastal Panel (C-GOOS-V)	4.3	E only
GOOS Report No. 95	Draft Report of the first session of the Coastal Ocean Observations Panel (COOP-I)	4.3	E only
GOOS Report No. 90	Coastal GOOS Design Plan	4.3	E only
GOOS Report No. 94	LMR Design Plan	4.3	E only
GOOS Report No. 99	HOTO GOOS Design Plan (draft)	4.3	E only
GOOS Report No. 92	Report of the First GOOS Users' Forum	4.4	E only
I-GOOS-V/Inf.4	Oceans Theme of the IGOS Partnership	4.5	E only
I-GOOS-V/Inf.5	Ocean Component of Carbon Theme of the IGOS Partnership	4.5	E only
I-GOOS-V/Inf.6	The Pilot Research Moored Array in the Tropical Atlantic (PIRATA) - Executive Summary	5.1	E only
I-GOOS-V/Inf.7	The TAO Implementation Panel Report	5.1	E only
I-GOOS-V/Inf.8	Report of the second meeting of the transition to JCOMM (JCOMM-TRANS-II)	5.3	E only
GOOS Report No. 100	Draft Report of the fifth session of the NEAR-GOOS Co-ordinating Committee (NEAR-GOOS-V)	5.4.2	E only
I-GOOS-V/Inf.9	Report on EuroGOOS	5.4.2	E only
GOOS Report No 85	Report on MedGOOS	5.4.2	E only
GOOS Report No 93	Report of 2 nd session of IOCARIBE-GOOS Advisory Group	5.4.2	E only
GOOS Report No 105	Report of 3 rd session of IOCARIBE-GOOS Advisory Group	5.4.2	E only
GOOS Report No. 96	Report of the PacificGOOS meeting in Apia	5.4.2	E only
I-GOOS-V/Inf.10	The WIOMAP Proposal	5.4.2	E only
I-GOOS-V/Inf.11	Report on Status of the IOC Regional Programme Office, Perth	5.4.2	E only
I-GOOS-V/Inf.12	Report of the IOC-ICES Steering Group for GOOS (draft)	5.4.2	E only
I-GOOS-V/Inf.12 Add. 1	IOC-ICES Steering Committee on GOOS (CO1): Exec. Summary	5.4.2	E only
I-GOOS-V/Inf.13	National reports (hard copy compilation of electronic submissions)	5.4.3	E only
I-GOOS-V/Inf.14	GOOS Data and Information Management Strategy and Plan	6.2.1	E only
I-GOOS-V/Inf.15	GOSIC – A Background and Status Report	6.2.2	E only
I-GOOS-V/Inf.16	GOOS News 10	9.2	E only
I-GOOS-V/Inf.17	Partnership for Observation of the Global Oceans (POGO)	--	E only
I-GOOS-V/Inf.18	GODAE Strategic Plan	5.2	E only
I-GOOS-V/Inf.19	IGOS-P Brochure	4.5	E only
I-GOOS-V/Inf.20	Draft Resolution I-GOOS-V/2 (Coastal GOOS)	4.3	E only
I-GOOS-V/Inf.21	A Review of the Global Ocean Observing System (GOOS) [IOC-XXI Draft Resolution for I-GOOS-V/DR-1 (Agenda Item 3)]	All	E only

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ANNEX IV

MAIN TASKS OF NATIONAL GOOS CO-ORDINATING COMMITTEE

- (i) Determine user needs and specify the data and products required to satisfy those needs;
- (ii) Identify and work to improve existing national capabilities, including resources, technology and communications (human skills and available technology);
- (iii) Identify gaps in those capabilities, and suggest improvements, including training and practical assistance;
- (iv) Pay special attention to exploiting the opportunities offered by the increasing number and variety of observations of the coastal zone and open ocean from space satellites;
- (v) Promote communication among users and providers of GOOS products;
- (vi) Encourage design and implementation of regional strategies for data acquisition, communication, synthesis and dissemination of needed products;
- (vii) Encourage development of pilot projects to demonstrate the usefulness of the GOOS approach;
- (viii) Evaluate costs and benefits as the basis for persuading governments, donor agencies and the private sector to support GOOS initiatives;
- (ix) Promote GOOS development and expansion through appropriate communication.

ANNEX V

I-GOOS RESOLUTION APPROVED BY THE 21st IOC ASSEMBLY

1. IOC Resolution XXI-7

**A REVIEW OF THE STRUCTURE OF THE GLOBAL OCEAN OBSERVING SYSTEM (GOOS)
(with Annex)**

The Intergovernmental Oceanographic Commission,

Recalling that:

- (i) the mandate for GOOS was first set out formally in March 1991 by the Assembly at its sixteenth session, in Resolution XVI-8,
- (ii) the Intergovernmental Committee for GOOS (I-GOOS) held its first session in February 1993,

Recognizing that periodic external reviews have been effective in assisting IOC and other sponsoring organizations to maintain the focus, efficiency and effectiveness of the programmes they support in changing times and circumstances,

Noting that:

- (i) GOOS implementation began with the inauguration of the GOOS Initial Observing System in 1998,
- (ii) I-GOOS at its fifth session endorsed the call made by the GOOS Steering Committee at its fourth session for a review of GOOS,

Decides that:

- (i) a review of the organizational structure of GOOS, to be carried out by an external independent Review Group and should take place in 2002 as described in the Annex to this Resolution;
- (ii) this review should be the first in a five-yearly cycle of such reviews by an independent group of experts;

Instructs the Executive Secretary IOC to:

- (i) initiate the review process according to the terms of reference and conditions given in the Annex to this Resolution;
- (ii) request the co-sponsors of GOOS, the IGOS Partners, other relevant partners and affiliated organizations to assist the Review Group.

Financial implications: US\$15,000 from the Regular Budget allocation, supplemented by the IOC Trust Fund and/or extra-budgetary sources if required.

Annex to IOC Resolution XXI-7

COMPOSITION AND SCOPE OF THE REVIEW OF GOOS

1. The Terms of Reference of the Review Group are to:
 - (i) review the development and implementation of GOOS, with particular attention to its structure, mandates and *modus operandi*, the activities of its advisory panels, the development of the GOOS Initial Observing System, including its pilot projects, the regional development of GOOS and the national development of GOOS;
 - (ii) review the extent to which capacity-building activities in support of GOOS can benefit Member States;
 - (iii) present the final review report to the Assembly at its 22nd session in 2003.
2. The following conditions shall apply to the review process:
 - (i) the Review Group shall comprise 4 experts drawn from nominations submitted preferably from operational agencies of Member States, and from different user communities;
 - (ii) proposals for nominations on the Review Group should be submitted to the IOC Executive Secretary by IOC Member States and GOOS sponsors (WMO, UNEP, ICSU) and should be chosen by the Chairman of IOC in consultation with the Heads of JCOMM, GPO, I-GOOS and GSC;
 - (iii) the Review Group should interview, as appropriate:
 - (a) the GPO staff;
 - (b) the chairpersons of GSC, I-GOOS and the past chairperson of I-GOOS;
 - (c) the national contacts of the Member States of I-GOOS;
 - (d) the chairpersons of the key advisory panels (OOPC, COOP and the GOOS Capacity Building Panel);
 - (e) the supervisor of GOSIC;
 - (f) the chairpersons of regional GOOS bodies;
 - (g) the directors of the GCOS and GTOS Secretariats;
 - (h) the representatives (Chairs, Presidents, etc.) of the major bodies involved in GOOS implementation (JCOMM, IODE); and
 - (i) the representatives of national implementation agencies, of user communities, of GODAE and Argo, of SCOR, of CEOS (from the IGOS Partnership), of the academic community (chosen from the membership of POGO) and of the co-sponsors of GOOS (WMO, UNEP, FAO and ICSU);
3. The review group should address the issues identified as requiring attention by I-GOOS-V;
4. Where possible, information should be obtained/sought through questionnaires and verbal discussions/ interviews, and correspondence should be by e-mail;
5. Meetings deemed necessary to collect information or for the purpose of clarification should coincide with scheduled meetings of such representatives;
6. Meetings may be conducted in different regions if the Review Group feels it necessary;
7. The review should be produced by the Review Group and submitted in draft form by its chairperson [or his (her) nominee] to the GOOS Steering Committee at its 6th session, for comments, and to I-GOOS at its 6th session. An interim progress report should be submitted to the next ordinary session of the Executive Council, and the final report should be presented to the IOC Assembly at its 22nd session (June/July 2003).

ANNEX VI

TEMPLATE FOR NATIONAL REPORTING

1. COUNTRY

Name

2. PRINCIPAL NATIONAL CONTACT FOR GOOS

Name, function, address, telephone, fax, e-mail

3. MECHANISM FOR NATIONAL COORDINATION OF GOOS

(e.g. National Oceanographic Commission; National GOOS Coordinating Committee; Other)

4. MEMBERSHIP OF REGIONAL GOOS BODIES

(EuroGOOS, Baltic GOOS, PacificGOOS, IOCARIBE-GOOS, NEAR-GOOS, Black Sea GOOS, MedGOOS, WIOMAP, Other)

5. NATIONAL CONTRIBUTIONS TO GOOS IMPLEMENTATION

In sections 5.1 through 5.4, below, please (i) differentiate between actual (present) and future (planned) contributions; (ii) indicate the agencies involved in each activity; (iii) list the web link URL for the activity, if there is one.

5.1 CONTRIBUTIONS TO ELEMENTS OF THE GOOS INITIAL OBSERVING SYSTEM

(Note: this excludes (i) contributions to pilot projects, which go under 5.2, below; (ii) research in support of GOOS, e.g. from research satellites or by other means, which goes under 5.3, below; (iii) other national contributions, which go under 5.4, below; and contributions to capacity building, which go under 6, below).

- The operational ENSO Observing System in the tropical Pacific, including the Tropical Atmosphere Ocean (TAO) array of buoys and TRITON buoys;
- Meteorological measurements from the Voluntary Observing Ship (VOS) network of the WMO;
- Upper ocean measurements of the Ship-of-Opportunity Programme (SOOP);
- Fixed and drifting buoys coordinated by the Data Buoy Cooperation Panel (DBCP);
- The Global Sea Level Observing System (GLOSS) network of tide gauges;
- The Global Temperature and Salinity Profile Programme (GTSP);
- The Global Coral Reef Monitoring Network (GCRMN);
- The Global Data Centre of the Atlantic Oceanographic and Meteorological Laboratory (AOML) of the US National Oceanic and Atmospheric Administration (NOAA);
- Ocean observations from the operational satellites of NOAA and other entities;
- The Continuous Plankton Recorder (CPR) programme of the Sir Alister Hardy Foundation for Ocean Science (SAHFOS);
- The ICES International Bottom Trawl Survey (IBTS) of the North Sea;
- Time Series Station 'S' off Bermuda;
- Time Series Station Bravo in the Labrador Sea;
- The JCOMM (ex-IGOSS) Electronic Products Bulletin;
- The Global Observing Systems Information Centre (GOSIC) at the University of Delaware;
- The California Cooperative Oceanic Fisheries Investigations (CalCOFI).

5.2 CONTRIBUTIONS TO GOOS PILOT PROJECTS

(This includes research related to these pilot projects).

- The Pilot Research Array in the Tropical Atlantic (PIRATA);
- The Global Ocean Data Assimilation Experiment (GODAE);
- The Argo float programme of GODAE;
- The RAMP (Rapid Assessment of Marine Pollution) pilot project of HOTO;
- Other Pilot Projects.

5.3 CONTRIBUTIONS TO ACTIVITIES OF REGIONAL GOOS BODIES

- NEARGOOS;
- EuroGOOS regional projects including:
 - (i) Baltic GOOS (BOOS);
 - (ii) Mediterranean;
 - (iii) Arctic;
 - (iv) Northwest Shelf;
 - (v) Atlantic;
 - (vi) Others;
- (PacificGOOS, IOCARIBE-GOOS, Black Sea GOOS, MedGOOS, WIOMAP, Other).

5.4 GOOS-RELATED RESEARCH

(This means topics not already mentioned above; e.g. satellite remote sensing carried out through research programmes; etc).

5.5 OTHER CONTRIBUTIONS TO GOOS

Buoys, hydrographic lines, and other observations that are not yet included in the GOOS Initial Observing System (e.g. Tide Gauges other than GLOSS); ocean and or weather and climate modelling activities/centres; National Ocean Data Centres; main ocean services and products and their sources.

6. CAPACITY BUILDING IN SUPPORT OF GOOS OR GOOS-RELATED RESEARCH

7. MECHANISM FOR COMMUNICATING NATIONAL ACTIVITIES

Newsletters, brochures, web site address, other.

8. INDICATIONS OF FINANCIAL CONTRIBUTION TO GOOS

Differentiate between actual and planned.

8.1 INVESTMENT IN NATIONAL ACTIVITIES

8.2 INVESTMENT IN NATIONAL COORDINATION

8.3 INVESTMENT (REAL OR POTENTIAL) IN INTERNATIONAL COORDINATION

9. SUGGESTIONS FOR WAYS TO IMPROVE GOOS

ANNEX VII

LIST OF ACRONYMS

ABE-LOS	Advisory Body of Experts on the Law of the Sea
AIC	Argo Information Centre
AOML	Atlantic Oceanographic and Meteorological Laboratory
ASEAN	Association of South-East Asian Nations
ASAP	Automated Shipboard Aerological Sampling Programme (WMO)
BlackMARS	Black Sea Marine Applications Research Study
BOOS	Baltic Operational Oceanographic System (Baltic GOOS)
CALCOFI	California Co-operative Oceanic Fisheries Investigations
CB	Capacity Building
CEOS	Committee on Earth Observing Satellites
C-GOOS	Coastal GOOS
CLIVAR	The Programme on the Variability of the Coupled Ocean-Atmosphere System and Climate Prediction (WCRP)
COOP	Coastal Ocean Observations Panel
CPPS	Permanent Commission for the South Pacific
CPR	Continuous Plankton Recorder
DBCP	Drifting Buoy Co-operation Panel
EC	European Commission
EDIOS	European Directory of the Initial Observing System
ENSO	El Niño and the Southern Oscillation
ESODAE	European Shelf Seas Data Assimilation and Forecast Experiment
EUMESTAT	European Organization for the Exploitation of Meteorological Satellites
EuroGOOS	European Programme for the Global Ocean Observing System
FAO	Food and Agricultural Organization of the United Nations
FCCC	Framework Convention on Climate Change
GAW	Global Atmosphere Watch
G3OS	GCOS/GOOS/GTOS
GCOS	Global Climate Observing System
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
GLOBEC	Global Ocean Ecosystems Dynamics
GOSIC	Global Observing Systems Information Centre
GLOSS	Global Sea-Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GOOS-IOS	GOOS Initial Observing System
GPA	Global Plan of Action
GPO	GOOS Project Office
GSC	GOOS Steering Committee
GTOS	Global Terrestrial Observing System
GTS	Global Telecommunication System (WMO)
GTSP	Global Temperature and Salinity Profile Programme
HELCOM	Helsinki Commission
HOTO	Health of the Ocean
ICES	International Council for the Exploration of the Sea
IBTS	International Bottom Trawl Survey
ICSU	International Council for Science
IGBP	International Geosphere-Biosphere Programme
IGOS	Integrated Global Observing Strategy
IGOSS	Integrated Global Ocean Services System
I-GOOS	Intergovernmental Committee for the Global Ocean Observing System

IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCINCWIO	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean
IODE	International Oceanographic Data and Information Exchange
IOI	International Ocean Institute
IRD	Institut de Recherche pour le Développement (formerly ORSTOM)
JCOMM	Joint IOC-WMO-Technical Commission on Oceanography and Marine Meteorology
J-DIMP	Joint GOOS-GCOS-GTOS Data and Information Panel
LME	Large Marine Ecosystem
LMR	Living Marine Resources
LOICZ	Land-Ocean Interactions in the Coastal Zone
MAMA	Mediterranean Network to Assess and Upgrade Monitoring and Forecasting Activities
MOU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration
NEARGOOS	North-East Asian Regional GOOS
NGCC	National GOOS Co-ordinating Committee
NGO	Non-Governmental Organization
NIWA	National Institute of Water and Atmospheric Research
NOAA	National Oceanic and Atmospheric Administration
NOC	National Oceanographic Committees
NODC	National Ocean Data Centre
NOOS	Northwest Shelf Operational Oceanographic System
NOWPAP	Northwest Pacific Action Plan
ODINAFRICA	Ocean Data and Information (Africa)
OOPC	Ocean Observation Panel for Climate
OOS	Ocean Observation Systems
OSPARCOM	Oslo-Paris Commission for the Protection of the Marine Environment for the North-East Atlantic
PacificGOOS	Pacific Global Ocean Observing System
PACSICOM	Pan African Conference on Sustainable Integrated Coastal Management
PICES	North Pacific Marine Science Organization
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
POGO	Partnership for Observations of the Global Ocean
RAC	Regional Activity Centre
RAMP	Rapid Assessment of Marine Pollution
RSP	Regional Seas Programme
SAHFOS	Sir Alister Hardy Foundation for Ocean Science
SCOR	Scientific Committee on Ocean Research
SEACAMP	South East Asia Centre for Atmospheric and Marine Prediction
SEA-GOOS	Southeast Asian GOOS
SERED	Scientific Educational Resources and Experience
SIO	Scripps Institution of Oceanography (University of California, USA)
SOOP	Ship-of-Opportunity Programme
SOOP-IP	Ship-of-Opportunity Programme Implementation Panel
SOPAC	South Pacific Applied Geoscience Commission
SPREP	South Pacific Regional Environment Programme
SST	Sea-Surface Temperature
SURFA	Surface Flux Analysis Project
TAO	Tropical Atmosphere Ocean Array
TEMA	Training, Education and Mutual Assistance in Marine Sciences
ToRs	Terms of Reference
UN	United Nations
UNLOS	United Nations Law of the Sea
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

UNFCCC.	United Nations Framework Convention on Climate Change
VOS	Voluntary Observing System
WCRP	World Climate Research Programme
WESTPAC	IOC Sub-Commission for the Western Pacific
WIOMAP	Western Indian Ocean Marine Applications Project
WMO	World Meteorological Organization of the United Nations
WSSD	World Summit on Sustainable Development
WOCE	World Ocean Circulation Experiment
WWW	World Weather Watch
XBT	Expendable Bathythermograph