



Intergovernmental Oceanographic Commission

Reports of Meetings of Experts and Equivalent Bodies

IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS)

Sixth Session

26 - 28 February 2003

Cape Town, South Africa

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of the Global Ocean Observing System
(GOOS)**

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ABSTRACT

The Sixth Session of the GOOS Steering Committee (GSC) met in Cape Town from 26-28 February 2003.

It reviewed and approved recent developments and future plans, and examined the draft 2002 Review of GOOS.

It set out its future programme in the shape of 56 Action items. Among these it decided: (i) to write to appropriate agencies to stress the importance of the Jason-2 high resolution satellite altimetry mission; (ii) to increase emphasis on building the capacity of developing countries to participate in and benefit from GOOS; (iii) to urge Member States to implement fully the global ocean climate observing system; (iv) to urge space agencies to provide for the continuity of key data streams for the global ocean climate observing system; (v) to improve linkages between OOPC, COOP, GODAE, and JCOMM; (vi) to organize a second review of the Global Observing System Information Centre (GOSIC); (vii) to encourage a collective approach to North Atlantic observations, with ICES, and to North Pacific observations, with PICES; (viii) to contribute to a Development Plan to improve funding; (ix) to finalize a Communication Plan; (x) to update the 5-year old GOOS Strategic Plan and GOOS Prospectus.

TABLE OF CONTENTS

SUMMARY	page
1. OPENING AND WELCOME.....	1
1.1 WELCOME, INTRODUCTIONS, SPONSOR ORGANIZATION'S COMMENTS	1
1.2 LOGISTICS	1
1.3 FORMATION OF SESSIONAL WORKING GROUPS DEALING WITH STRATEGIC PLANNING, CAPACITY BUILDING, AND WORK PROGRAMME AND BUDGET	1
2. OVERVIEWS OF GOOS DEVELOPMENTS	1
2.1 STRATEGIC OVERVIEW	1
2.2 THE INTERGOVERNMENTAL PERSPECTIVE.....	2
2.3 REPORT AND PERSPECTIVE OF THE GOOS PROJECT OFFICE	2
2.4 CHARGE TO SESSIONAL WORKING GROUP ON WORK PROGRAMME AND BUDGET	3
3. THE GOOS REVIEW	3
3.1 THE EXTERNAL REVIEW OF GOOS	3
3.2 OPEN DISCUSSION OF ISSUES	5
3.3 CHARGE TO SESSIONAL WORKING GROUP ON STRATEGIC PLANNING	6
4. GOOS CAPACITY BUILDING.....	6
4.1 GOOS CAPACITY BUILDING PANEL AND RELATION TO JCOMM	6
4.2 RELATED ACTIVITIES (POGO, IOCCG, ETC)	8
4.3 CHARGE TO SESSIONAL WORKING GROUP ON CAPACITY BUILDING	9
5. STATUS OF GOOS DESIGN PLANS AND PILOT PROJECTS	9
5.1 COASTAL OCEAN OBSERVATIONS	9
5.1.1 Membership of the COOP.....	9
5.1.2 The Integrated Design Plan for the Coastal Module of GOOS	9
5.1.3 COOP-OOPC	10
5.1.4 COOP-IOGOOS	10
5.1.5 COOP and Integrated Coastal Area Management.....	10
5.1.6 COOP-ICES-EuroGOOS.....	10
5.2 OPEN OCEAN OBSERVATIONS	11
6. IMPLEMENTATION OF GLOBAL GOOS DESIGNS.....	14
6.1 <i>IN SITU</i> OBSERVATIONS	14
6.2 THE OCEAN THEME—ROLLING REVIEW PROCESS FOR SATELLITE REQUIREMENTS.....	15
6.3 DATA AND INFORMATION MANAGEMENT	16
6.3.1 JCOMM	16
6.3.2 GOSIC.....	17
6.3.3 The Ocean Information Technology Project.....	18
6.3.4 The GOOS Data and Information Management Plan.....	19
6.4 INDICATORS	19

7. REGIONAL/NATIONAL GOOS DEVELOPMENTS	21
7.1 REGIONAL GOOS ALLIANCES – REPORT ON FIRST REGIONAL GOOS FORUM.....	21
7.2 COORDINATION WITH OTHER REGIONAL ACTIVITIES (UNEP, FAO, LME)	22
7.3 IOC-GOOS REGIONAL OFFICES	22
7.4 NATIONAL GOOS DEVELOPMENTS	22
8. COMMITTEE BUSINESS - A	23
8.1 REPORT OF SESSIONAL WORKING GROUP ON PROGRAMME AND BUDGET, AND APPROVAL OF WORK PROGRAMME AND BUDGET	23
8.2 REPORT OF SESSIONAL WORKING GROUP ON CAPACITY BUILDING, AND AGREEMENT ON ACTIONS REQUIRED IN CAPACITY BUILDING	24
8.3 SUGGESTIONS FOR OUTREACH AND COMMUNICATIONS	25
9. STRATEGIC REVIEW	29
9.1 REPORT OF THE GSC SESSIONAL WORKING GROUP ON STRATEGY (INCLUDING THE GOOS REVIEW).....	29
9.2 REFINING THE GOOS STRUCTURE	32
10. COMMITTEE BUSINESS - B	36
10.1 MEMBERSHIP OF GSC AND ITS ADVISORY PANELS	36
10.2 REVIEW AND AGREEMENT ON ACTION ITEMS	36
10.3 DATE AND VENUE OF GSC-VII	37
11. CLOSURE	37
12. LIST OF ACTIONS.....	37

ANNEXES

I.	AGENDA
II.	LIST OF PARTICIPANTS
III.	LIST OF DOCUMENTS
IV.	GOOS CAPACITY BUILDING ACTION PLAN
V.	TERMS OF REFERENCE OF JCOMM SERVICES COORDINATION GROUP TASK TEAM ON DEVELOPMENT OF OCEAN SERVICES
VI.	LIST OF ACRONYMS

1. OPENING AND WELCOME

1.1 WELCOME, INTRODUCTIONS, SPONSOR ORGANIZATION'S COMMENTS

The Sixth Session of the Global Ocean Observing System (GOOS) Steering Committee (GSC) was called to order by its chairman, D. James Baker, on Wednesday 26 February 2003, at 09:00, in the Breakwater Lodge, Cape Town, South Africa. Prof. Geoff Brundrit of the University of Cape Town (UCT) welcomed the Committee to Africa, Cape Town, and the UCT. Representatives of the GOOS sponsoring agencies (IOC, WMO, UNEP and ICSU) briefly addressed the Committee, noting the importance of GOOS, the good progress being made in its development, and their commitment to support its continuing development.

1.2 LOGISTICS

The provisional agenda ([Annex I](#)) and timetable (working documents GSC-VI/1 and 2) were adopted.

The Director of the GOOS Project Office (GPO), Colin Summerhayes, introduced the documentation for the meeting (working document GSC-VI/4) ([Annex II](#)) and circulated the List of Participants (working document GSC-VI/3) for correction ([Annex III](#)).

Action 1: GPO to put all documents on the website (in .rtf format), where possible, to make them readily accessible to all.

1.3 FORMATION OF SESSIONAL WORKING GROUPS DEALING WITH STRATEGIC PLANNING, CAPACITY BUILDING, AND WORK PROGRAMME AND BUDGET

The Committee nominated individuals to serve on one or other of three sessional working groups designed to address (i) strategic planning (W. Nowlin, Chair); (ii) capacity building (H. Yap, Chair); and (iii) the work programme and budget (R. Rayner, Chair).

2. OVERVIEWS OF GOOS DEVELOPMENTS

2.1 STRATEGIC OVERVIEW

Jim Baker noted that there had been some key developments during the year since GSC-V, including notably the 3rd EuroGOOS Conference on Operational Oceanography (Athens, 3–5 December 2002); the 1st Regional GOOS Forum (Athens, 2–6 December 2002); the 1st GODAE Conference (Biarritz, 13–15 June 2002); the continuance of deployment of Argo floats, which had now passed the 600 mark; and completion of the Coastal GOOS Design Plan.

The Chairman offered his view on priority issues to be considered at GSC-VI. He emphasized five topics: (i) there is a need to revisit the strategic plan for GOOS, which was written in 1997 and published in January 1998 as Version 1.0; (ii) the Committee needs to consider the draft report on the GOOS Review, and decide what feedback if any it wishes to provide to the Review Group; (iii) there is a need for focus on improving the ways in which GOOS approaches and handles data and information management; (iv) regional development and associated capacity building are going to be extremely important in engaging developing countries; and (v) the success of GOOS will also depend on public recognition, indicators, and communications. He noted the importance of developing exhibits for museums on GOOS and its products, as a way of raising public interest in operational oceanography. He went on to note the emphasis placed by the World Summit on Sustainable Development at Johannesburg (WSSD) in August/September 2002

(background document GSC-VI/B1) on global observations as tools for monitoring and measuring progress in sustainable development.

The Committee noted the importance of the Jason-2 satellite mission as a key tool for satellite altimetry for the future.

Action 2: (i) GSC Chair to draft a letter to go to appropriate agencies to stress the importance of Jason-2 for the success of GOOS; (ii) similar letters to be drafted and sent by OOPC, by COOP, by Ralph Rayner (from the UK Marine Information Council), and by Tony Knap (operating through POGO).

2.2 THE INTERGOVERNMENTAL PERSPECTIVE

Silvana Vallerga, Chairperson of the Intergovernmental Committee for GOOS (I-GOOS), gave an I-GOOS perspective on the future of GOOS (working document GSC-VI/8). The report of I-GOOS-V was provided as a background document (GSC-VI/B2). Key goals for I-GOOS are: (i) to facilitate the transition from research prototypes into operations; (ii) to learn from the regional GOOS bodies about their needs, and to satisfy their requirements; (iii) to build the capacity of all countries to engage in and benefit from GOOS; and (iv) to understand the requirements for and possible limitations on the collection of operational observations in EEZs, particularly from new technologies such as floats and AUVs.

The mechanism of the Regional GOOS Forum is already enabling us to meet Goal (ii). Capacity building, Goal (iii), is currently being addressed through the development of a proposal to the European Commission's Framework 6 Programme (EC FP6) entitled GOOS Regional Alliances Network Development (GRAND). This will assess needs, transfer technologies, exchange personnel, and raise awareness about GOOS. Goal (iv) has been addressed through a consultant's report that will be presented to I-GOOS-VI (10–14 March 2003), and will require I-GOOS to work with other appropriate bodies [such as the IOC's Advisory Board of Experts on the Law of the Sea (ABE-LOS)] to solve the problem. Goal (i) transition from scientific research to operations is expected to be addressed by the GSC and JCOMM.

The Committee considered that it was very important for I-GOOS to have the kind of focus that had been outlined in the review, agreed that the 4 goals were important, and wished the I-GOOS chair success in achieving the 4 goals. It was noted that it would be useful to find out through I-GOOS what individual nations are doing to assess the state of their ocean ecosystems, expanding to all countries the type of survey used in the Mediterranean MAMA project.

Action 3: I-GOOS to consider asking Member States to report on what they are doing to assess the state of their ocean ecosystems.

2.3 REPORT AND PERSPECTIVE OF THE GOOS PROJECT OFFICE

Colin Summerhayes reported briefly on the accomplishments and needs of the GPO (working document GSC-VI/9). He noted in particular the extensive growth in tasks required of the GPO in recent years by the creation of several regional GOOS bodies, the arrival of JCOMM, the growth of links with the space agencies, and the expansion of the activities of I-GOOS. He explained that while the staff had grown to meet the growth in demands of regional bodies—especially by staffing in field offices such as Perth and Rio, there had been no commensurate growth (and indeed a decline) in the staff at headquarters in Paris. This meant that the few staff in Paris was increasingly overwhelmed by the demands on their time, which would lead to decreased efficiency and effectiveness of the support system for international coordination. He noted that he

had recently had some success in resourcing JCOMM, through the recruitment of Ms. B. Lee, from Rep. of Korea, in February 2003, as a trainee, and through the offer of a secondment of Ms. C. Clark, from NOAA, in 2004–2005. This still left GOOS under-resourced. Secondments would be welcome. It would be useful for individual agencies to make available staff time in their home offices. The GPO would be happy to work with a distributed team.

The Director gave a brief overview of plans for and progress with GOOS communications, noting especially: (i) replacement of the 6 monthly issuing of GOOS News by more timely GOOS News Flashes; (ii) postponement of the GOOS Brochure pending the results of the GOOS Review; (iii) lack of progress on the Biennial GOOS Review, owing to pressure on staff time; (iv) publication of the 3rd issue of the GOOS Products and Services Bulletin, thanks to the efforts of Texas A & M university (a task undertaken there because of the pressure on staff time in the GPO); and (iv) recent improvements in the GOOS website, which were continuing.

The Committee commended the GPO and its distributed network of operators in carrying out GOOS business efficiently and effectively, and took note of the pressure on staff, and the effects of this on the production of essential communications. The Committee noted that in recent years the section of the IOC Annual Report devoted to GOOS had increased significantly, and provided a succinct and useful overview of GOOS from year to year. The Committee commended the GPO on the broad, diverse and up-to-date content of the GOOS website, and especially on making available a range of PowerPoint presentations.

Action 4: The GSC requests the Executive Secretary of the IOC to give a high priority to working with Member States to ensure that the GPO is resourced with personnel at a level adequate to the tasks required of it by Member States through I-GOOS and JCOMM, so as to meet the requirements of the GSC, I-GOOS and JCOMM, noting that given the existence of the Internet, new staff do not have to work in Paris but could work part-time or full-time for GOOS in their own home offices.

Worth Nowlin reported that Texas A & M was now ready with new issues of the GOOS Products and Services Bulletin.

Action 5: Members to provide or suggest key articles to launch new issues of the GOOS Products and Services Bulletin.

2.4 CHARGE TO SESSIONAL WORKING GROUP ON WORK PROGRAMME AND BUDGET

Colin Summerhayes presented the work programme and budget for the next biennium (working document GSC-VI/10), noting that as requested by GSC-V an outcome had been identified for each activity.

The sessional working group formed under agenda item 1.3 was invited to examine the work programme and budget and the anticipated outcomes, and to report on them under agenda item 8.1.

3. THE GOOS REVIEW

3.1 THE EXTERNAL REVIEW OF GOOS

Paul Mason, Chair of the Group of Experts charged with reviewing the structure, mandates and *modus operandi* of GOOS, reported on progress with the review, which is following a plan approved by the 21st IOC Assembly (July, 2001) and which will be reported to the 22nd IOC Assembly (June 2003) (working document GSC-VI/11). He welcomed suggestions from the GSC

that might improve the Report, and mentioned that the draft would also be presented for comment to I-GOOS-VI (10–14 March 2003). The Group would take comments from the GSC and I-GOOS on board in finalizing their Report for the Assembly.

The Committee noted that the GOOS Review was the IOC's response to a recommendation initially proposed by GSC-IV and approved by I-GOOS-V. The IOC Assembly had decided to focus the review on certain particular aspects of GOOS. To address these issues, the Review Group had distributed a questionnaire focusing on 7 main questions:

- (i) Is the present structure adequate?
- (ii) Are COOP and OOPC adequate as advisory panels?
- (iii) Is the GOOS-IOS + pilot projects adequate?
- (iv) Is GOOS implementation and governance consistent with its mandate?
- (v) Is the *modus operandi* appropriate?
- (vi) Should GRAs be better integrated into GOOS?
- (vii) Is GOOS capacity building effective (yet)?

Professor Mason had been surprised by the wide diversity of responses to the questionnaire, and by the lack of understanding of GOOS expressed by some respondents, which tended to suggest that more needed to be done to explain what GOOS is (and what it is not). He had also been surprised by the ambitions of some respondents, which, in his view, expected far more rapid and extensive progress than was practicable. There was a need for GOOS development to be more focused and incremental. One of the blocks to GOOS development seems to be the lack of coordination of ocean observations at the national level.

He walked the Committee through the main recommendations of the Review Group, as listed in GSC-VI/11. These included proposed revisions to the Terms of Reference of I-GOOS, the GSC and the GPO, all of which are out of date—especially bearing in mind the recent development of I-GOOS and JCOMM.

The main recommendations for the GSC are as follows:

- (i) The GSC should be subject to the governance of all sponsors and its functions should recognize that its status is wider than that of a simple subsidiary body.
- (ii) The present constitution of the GSC should be retained to ensure that the advice is scientifically sound and includes an informed judgment in relation to national implementation capacity.
- (iii) The GSC should routinely report on the balance of the membership in order that the I-GOOS remains well informed.
- (iv) The GSC should maintain contact with the I-GOOS Board and report formally to meetings of I-GOOS.
- (v) The GSC should consider forming an advisory panel on ocean data assimilation, modelling and the generation of forecasts and products.
- (vi) The GSC's capacity building panel should become the responsibility of I-GOOS.
- (vii) The GSC ToRs should be amended to reflect its overarching role (to maintain a long-term strategic plan for GOOS).

The new ToRs proposed for the GSC by the Review Group are:

- (i) Primarily to maintain for the I-GOOS and GOOS sponsors a long-term strategic plan for GOOS. This plan should cover:
 - the current status of and weaknesses in all real-time and delayed-time ocean and marine observing systems;
 - the overall status of and weaknesses and opportunities in data and information management within GOOS;
 - the status of and weaknesses and opportunities in ocean analysis and forecasting systems;
 - the identification of research needs for new ocean measurement systems and forecasting systems for GOOS;
 - the development of plans for the migration of research measurements into operations within JCOMM;
 - the development and review of requirements in response to changing user needs.
- (ii) To undertake, in coordination with the I-GOOS Board, activities to assist in gaining community wide understanding of and support for the agreed programme.
- (iii) To undertake, in coordination with the I-GOOS capacity building activities aimed at improved scientific capability.

The main recommendations for the GPO are:

- the ToRs for the GPO should be modified to reflect its support for I-GOOS, the GSC, and JCOMM, and to indicate that it should report formally to I-GOOS and the GSC (as it in fact does);
- IOC should recognize the key role that the GPO provides in enabling the GOOS to continue to develop and indeed exist, and should therefore ensure that it is appropriately resourced.

3.2 OPEN DISCUSSION OF ISSUES

There was a wide-ranging discussion on the content of the presentation.

Among other things, it was noted that after the Review Group Report had been drafted the 2nd meeting of the JCOMM Management Committee had recommended that the GOOS and JCOMM CB Panels should be combined.

Action 6: The Review Group would need to take into consideration the recent recommendation by the JCOMM Management Committee, and its acceptance by GSC-VI (see below) that the GOOS and JCOMM CB Panels should be combined.

The Committee agreed that a body such as I-GOOS was needed to represent the interests of the ‘owners’ of GOOS—namely the Member States. The review is ultimately for those people, not for the scientific community. It will have a significant impact on the thinking of those national representatives.

The Committee also agreed that there should be more emphasis on the importance of the role of the GOOS Regional Alliances (GRAs) in taking forward the implementation of GOOS.

The Committee felt that it would be desirable to merge the I-GOOS Board and the GOOS Steering Committee's Executive Committee into a combined GOOS Board to carry the responsibility for inter-sessional management of GOOS.

Further comments and actions are listed under agenda item 9.3.

3.3 CHARGE TO SESSIONAL WORKING GROUP ON STRATEGIC PLANNING

The sessional working group formed under agenda item 1.3 was invited to consider the report of the Review Panel, and the outcome of the discussions from agenda item 3.2, in developing ideas for the strategic planning exercise that forms the subject of agenda items 9.1 and 9.2, and in developing a response for the 2002 GOOS Review Group (see agenda item 9.3). The working documents for this exercise were the GOOS Strategic Plan Version 1.0, written in 1997 and published in January 1998 (GOOS Report 41), and the draft 2002 Review of GOOS (working document GSC-VI/11).

4. GOOS CAPACITY BUILDING

4.1 GOOS CAPACITY BUILDING PANEL AND RELATION TO JCOMM

Geoff Brundrit (Chair of the GOOS Capacity Building Panel), provided a report on the GOOS capacity building programme, reviewing recent activities, and setting out future plans (working document GSC-VI/13) (background document GSC-VI/B3). He focused in particular on the Action Plan for GOOS capacity building, and on the development of priorities for action. He reminded the Committee that substantial progress was already being made in that existing GOOS CB elements included: (i) the Statement of Principles (GOOS 69); (ii) the Implementation Strategy (GOOS 106); (iii) the Capacity Building Panel; (iv) shared responsibility with JCOMM Capacity Building Coordination Group (CBCG); (v) a number of existing capacity building activities (e.g., IODE, UNESCO Bilko project); (vi) a number of existing Partnerships (e.g., POGO, IGOS Partners); (vii) the GOOS Project Office staff in Paris, Bangkok, Perth, Rio and Cartagena with part time responsibilities for CB; (viii) GOOS Regional Alliance Secretariats with similar part time responsibilities (e.g. MedGOOS); and (ix) approximately \$250,000 annually in programme costs in support of GOOS-CB.

He also reminded the Committee that the Panel was made up of representatives of (i) OOPC, (ii) COOP, (iii) the UNESCO Bilko training programme in remote sensing, (iv) GOOS-AFRICA, (v) POGO, (vi) UNEP, (vii) IODE, (viii) Perth Office, (ix) industry, (x) the donor community, (xi) developing countries (specifically India, Argentina, Brazil). Japan had sent observers to the CB meeting.

The GSC recalled that the GOOS CB Panel Mission Statement was *to develop the capacity building needed to ensure the growth, development, sustenance and evolution of GOOS worldwide. The long-term objective is to build a solid foundation for global operational oceanography to ensure the complete development of GOOS by 2008–2010.*

Achieving the mission requires developing and maintain the scientific capacity required for GOOS; raising understanding and awareness of the value of observations and their benefits; facilitating the creation of baseline networks in critical areas; and raising abilities to participate in and benefit from GOOS. These objectives in turn call for specific attention to such factors as:

awareness raising; education and training; national and regional support structures; networks and partnerships; broad infrastructure; communication; and mutual assistance.

The Action Plan (see [Annex IV](#)) details the short- to medium-term objectives, the actions and the timeframes required to realise selected high-priority objectives. GRAs are seen as essential for implementation, and it is suggested that the Action Plan is used as a template by national and regional GOOS bodies and GOOS technical panels. The Panel sees Partnerships as being critical to meeting the objectives. The Action Plan builds on existing initiatives and is expected to evolve as targets and priorities change; for this reason this Action Plan is considered to represent phase I of the GOOS capacity building programme. Capacity building is needed to improve performance at the national, regional and global levels, and to enable developing countries in particular to participate in, benefit from, and contribute to GOOS.

The key action areas of the Action Plan ([Annex IV](#)) are: (i) infrastructure; (ii) remote sensing; (iii) *in situ* observations; (iv) ocean models and forecasting; and (v) data and information management exchange and delivery.

Top Priority Actions in Phase 1 are: (i) to create and sustain a capacity-building staff position within the IOC to coordinate capacity building activities; and (ii) in cooperation with I-GOOS and the JCOMM Task Team on Resources, to acquire the necessary resources to implement Phase I. In addition a number of specific actions are required in partnership with other organizations – for example in consultation with JCOMM, WMO and CEOS, to develop a plan to guide capacity building in remote sensing. Several educational activities were also identified (see [Annex IV](#)).

The Committee noted the need to raise awareness of decision makers within government bureaucracies. They also noted the need to ensure that developing countries were able to participate in and contribute to the exchange of data in real-time. The Committee noted that IOC was already taking steps to promote the Bilko training programme in remote sensing, and that a representative of that programme (Craig Donlon, the GOOS CB Panel Vice Chairman) would be addressing I-GOOS and the IOC Assembly on this topic. The Committee agreed that GOOS capacity building should capitalise on existing ocean training programmes. The programme should also capitalise on the existing programmes of other CB agencies.

Action 7: The GSC requests the Executive Secretary of the IOC to make available to the GOOS CB programme at least 50% of the time of the new IOC P5 grade post in Capacity Building when the new recruit arrives in post later this year.

Peter Dexter reported on the development of a capacity-building programme for JCOMM (background document GSC-VI/B4). The role of the Capacity Building Coordination Group (CBCG) is coordination and strategy, not specific implementation. It also provides oversight of the implementation of the JCOMM CB strategy. In addition, it initiates CB surveys to address regional CB requirements for JCOMM, and develops priorities. It develops procedures for assessing the effectiveness of CB activities.

He noted that the First Session of the CBCG had been held concurrently with the GOOS CB Panel to allow both to exchange ideas and eliminate duplication. There were many joint or coordinated activities. There was also close coordination with IODE and WMO in relevant activities.

He highlighted one particular CB activity, the development of the Western Indian Ocean Marine Applications Project (WIOMAP). This had been in development since 1996, with the final

project meeting, taking place in association with the IOGOOS meeting in Mauritius (1–2 November 2002). WIOMAP has now been accepted as a pilot project of IOGOOS.

A JCOMM Task Team on Resources had been created to consider how to raise the resources required to implement the capacity building required. It met in early February and the report of the meeting was now available. The TTR could also be used to seek resources for GOOS CB.

In discussion it was noted that IODE was willing to develop Ocean Teacher to provide training modules for JCOMM. The Committee welcomed the offer of the Task Team on Resources for seeking for resources for GOOS CB.

Paul Mason, Chair of GCOS, reported briefly on the outcomes of and plans for the GCOS programme of regional workshops for capacity building (background document GSC-VI/B5). At the request of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC) several workshops had now been held in different regions, especially in developing countries, with the support of funding from the Global Environment Facility (GEF) of the World Bank. Their objectives were to stimulate national and regional coordination, and to create plans for funding. Marine scientists had been involved in most of these meetings to represent GOOS interests. Action Plans had been produced from each workshop to indicate what activities, technologies and capacity building were needed to develop and at least maintain the observing system for climate in the region in question. Sea-level measurement had emerged as an essential technique for monitoring climate change.

The Committee noted and endorsed the various developments in CB being made by the GOOS, GCOS and JCOMM CB Panels.

4.2 RELATED ACTIVITIES (POGO, IOCCG, etc.)

Tony Knap introduced the capacity building activities of the Partnership for Observations of the Global Oceans (POGO), which focus on the provision of Fellowships for training in ocean observing techniques (background document GSC-VI/B6). Being an association of laboratory directors, POGO offers access to resources that would not normally be accessible to GOOS. It also provides a vehicle for the development of N-S links.

Action 8: GSC Chair to work with POGO to help to get more resources into POGO, and to help to broaden POGO membership.

Colin Summerhayes noted that capacity-building activities in support of or complementary to GOOS were also being undertaken by other agencies, for example: (i) the International Ocean Colour Coordinating Group (IOCCG) (background document GSC-VI/B7); (ii) the IODE (background document GSC-VI/B8); and (iii) the CEOS Working Group on Education and Training (background document GSC-VI/B9). Efforts are being made to develop an inventory of capacity building activities within the various global observing domains, as the basis for developing a more coherent and integrated capacity building programme in support of global observing. The inventory and related plans will be considered at the next meeting of the IGOS Partners (June 2003).

Johannes Guddal noted that WMO had a number of training programmes that covered GOOS interests, including one on disaster reduction in (tropical) coastal lowlands that has a link to IOGOOS and GOOS-AFRICA.

The Committee noted and endorsed the various developments in support of GOOS CB. It observed that different approaches to CB would be needed in those areas that do and do not have the necessary infrastructure and people.

4.3 CHARGE TO SESSIONAL WORKING GROUP ON CAPACITY BUILDING

Given the various reports on capacity building, including the Action Plan, the sessional working group formed under agenda item 1.3 was invited to consider (i) how the Action Plan might be improved, and (ii) what steps should be taken to develop a comprehensive and integrated programme for capacity building in support of global observations, and to report back under agenda item 8.2.

5. STATUS OF GOOS DESIGN PLANS AND PILOT PROJECTS

Pilot Project definition: Following the meeting, the GSC Executive Committee agreed that GSC would endorse the following definition of a pilot project, which had been proposed by Worth Nowlin, was endorsed at GSC-IV, but had not made its way into the report of that meeting. The definition is as follows:

A GOOS pilot project is defined as an organized, planned set of activities with focused objectives designed to provide an evaluation of technology, methods, or concepts within a defined schedule and having the overall goal of advancing the development of the sustained, integrated ocean observing system.

This definition has been adopted by GODAE, OOPC, COOP, JCOMM, and IODE, and its formal adoption here ensures consistency across these various bodies. The decision was made to include the definition here so as to avoid waiting a further year for its formal approval.

5.1 COASTAL OCEAN OBSERVATIONS

Tom Malone (COOP Co-Chairman) reported on progress with COOP activities (working document GSC-VI/14), noting that the COOP final design plan was available as a background document (GSC-VI/B10).

5.1.1 Membership of the COOP

Drs. Dewailly, Gajewski, Korenteng and Smirnov rotated off the COOP in August 2002. Four new members were selected: (1) Dr. Laura David, Marine Science Institute, College of Science, University of the Philippines, PHILIPPINES; (2) Dr. Marcel Babin, Laboratoire d'Océanographie de Villefranche, Université Pierre et Marie Curie, FRANCE; (3) Dr. Vladimir L. Vladymyrov, Scientific Liaison & Information Management Officer, Programme Coordination Unit, Caspian Environment Programme, AZERBAIJAN; and (4) Dr. Jeffrey Polovina, Ecosystem Environment Investigation, NOAA, USA.

5.1.2 The Integrated Design Plan for the Coastal Module of GOOS

The COOP has completed the design plan following extensive external review and editorial recommendations from N. Flemming. Highlights of the plan were presented. The plan was endorsed by the GSC. The full plan can be found at <http://ioc.unesco.org/goos/gsc6/COOP-Design-Plan.doc>.

5.1.3 COOP-OOPC

To ensure coordination, the Chairs of the OOPC and COOP have been participating and will continue to participate in meetings of both panels. A joint COOP-OOPC Pilot Project is to be developed at COOP-V in March 2003. Joint pilot projects were also initiated at the 1st Indian Ocean GOOS Conference (see below).

5.1.4 COOP-IOGOOS

T. Malone, J. Hall and M. Wafar organized the coastal session of the 1st Indian Ocean GOOS Conference in Mauritius (4–9 November 2002). Using the “Integrated Design Plan for the Coastal Module of GOOS” as a guide, representatives of the coastal research and coastal zone management communities from 15 countries in the Indian Ocean region met for the first time to (i) initiate a network of coastal scientists that will link the countries that border the Indian Ocean; (ii) identify 2-3 high priority coastal phenomena that would benefit from the development of the coastal module of GOOS; and (iii) form teams to develop proposals for GOOS pilot projects that link basin scale GOOS to the coastal module of GOOS.

5.1.5 COOP and Integrated Coastal Area Management

T. Malone participated in the Coastal Environmental Science and Technology (CEST) Panel meeting in Hayama, Japan (15–21 July, 2002), where he gave an invited talk on the coastal module of GOOS and its importance to integrated coastal zone management. The panel has recommended that coastal GOOS be implemented for the purposes of integrated coastal zone management by both countries.

5.1.6 COOP-ICES-EuroGOOS

T. Malone presented a keynote address at the ICES Centenary Science Conference (1-5 October 2002). The presentation, “The Coastal Module of GOOS: A Leadership Role for ICES”, was well received and the plan is being used as a blueprint for organizing a monitoring programme in support of ecosystem-based fisheries management in the North Sea. At the 3rd EuroGOOS Conference (2–6 December 2002), T. Malone delivered an invited talk on the integrated design plan for the coastal module of GOOS, and participated in discussions of the role of GOOS regional alliances in establishing the coastal module. The plan was well received and will be used as a blueprint for developing the coastal module of EuroGOOS.

Action 9: Tom Malone to work with COOP to write a COOP letter in support of Jason-2, and to make appropriate recommendations to the US Oceans Commission and other appropriate national bodies on the need for HF radar.

The Committee noted the concern by some members that there had been difficulties in creating strong links between the GOOS community and the fisheries science community. This did not seem to be a universal problem. Indeed some members noted that the differences between these two communities had become much less in recent years as the fisheries science community developed interests in the ecosystem-based approach to fisheries management and in the development and maintenance of Marine Protected Areas—both of which require access to good marine science. The holding of a GOOS workshop at the ICES Annual Science Conference in Copenhagen in September 2002 was a good example of the growing linkage between the two communities, and the EuroGOOS-ICES NORSEPP project in the North Sea was another good example of the way in which the GOOS and fisheries science communities can come together with a common goal.

The GSC noted that GTOS was comfortable with the linkages that had developed between COOP and GTOS. There was still a question about how GOOS and GTOS would be linked structurally in future in terms of meeting the requirements by the ocean community of data from the land (e.g. on runoff).

The Committee noted that there was a need to develop standards, method manuals and reference materials to underpin the development of a GOOS in coastal seas, and to help developing countries develop their capacities.

The Committee noted that there was considerable potential interest from the GRAs in applying the COOP design plan, and in having GRAs test the COOP design.

Action 10: GSC to encourage through I-GOOS-VI and the GRAs the development of pilot projects at the regional level to demonstrate the usefulness of the ecosystem-based approach to fisheries and environmental management, with a view to a report on progress at GSC-VII.

The Committee agreed that there was some merit in the idea of a Federation of GRAs. The Committee noted that I-GOOS-V had established a GOOS Regional Forum, which had held its first meeting in Athens in December 2002, and recognized that the GOOS Regional Forum embodies the concept of a Federation of GRAs.

Action 11: The GSC asked I-GOOS to consider how it might encourage the development of the concept of a Federation of GRAs, using the Regional GOOS Forum as a starting point.

The Committee endorsed COOP plans, and congratulated the two co-chairs and their panel on doing a splendid job to finalise the design plan ready for publication.

5.2 OPEN OCEAN OBSERVATIONS

Ed Harrison (Chair OOPC) reported on progress with OOPC activities including GODAE and Argo (working document GSC-VI/15) (background document GSC-VI/B11).

It has been a busy year for the Ocean Observations Panel for Climate (OOPC). The OOPC report to GSC-VI describes the wide range of activities and the considerable progress made, and should be referred to by interested parties. OOPC-8 will take place in Ottawa, Canada, from 3–6 September 2003.

The Chair briefed the GSC on the status of the global ocean climate observing system, as of early 2003, relative to its situation in 1992, and described recommended actions to implement the initial global ocean climate observing system. These recommended 'next steps' forward have been developed via the OceanObs99 conference, which included the climate research, sustained observation and satellite communities, and subsequent work by the ocean hydrographic and carbon communities. The next steps have broad ocean community support, are feasible for global deployment with existing technology and will lead to significant improvement in knowledge of the state of the global ocean for climate purposes. They will also foster continued interaction between the research and sustained observation communities, with particular focus on improving technology for routine observation of ocean biogeochemical variables.

Because knowledge of the global ocean is incomplete and technology is evolving constantly, it is important also to implement a process to guide the evolution of the initial ocean observing system as more is learned and new technology is proven via the recommended path between research and operations.

The next steps are needed because the global ocean is not adequately observed at present for most purposes. Global coverage at climate accuracy remains a goal, not a reality, for any important ocean variable, according to the Second Report on the Adequacy of the Global Climate Observing System which has been prepared for the UN Framework Convention on Climate Change. At present, coverage is roughly 40% of what is needed for the initial observing system, ranging from about 20% of the called-for Argo profiling float coverage to satisfactory coverage by precision satellite altimetry (via TOPEX/Poseidon and Jason-I).

Important coverage gaps exist across the planet, but particularly at high latitudes and in the southern hemisphere. Considerable challenges exist in producing climate accuracy global analyses of ocean variables, even for Sea Surface Temperature; SST data coverage and some analysis challenges were illustrated for the GSC.

It is requested that the IOC approach its Member Nations for national commitments to implement the next steps and create the initial global ocean climate observing system.

The Global Ocean Data Assimilation Experiment has entered its Demonstration Phase (2003–2005) and its regional comparison projects are spinning up. Regional ocean analyses are now being made routinely and most are available via the Web. Global ocean analyses are planned and will be available within the year if all goes as anticipated. The GODAE data servers are making ocean data and operational surface meteorology fields available with unprecedented access and no cost to all interested parties. Coastal ocean communities are encouraged to investigate the utility of GODAE products to assist in the analysis and forecasting of coastal ocean conditions.

The Committee recognized the importance of obtaining GLOSS data from the full suite of GLOSS stations and the difficulty in maintaining GLOSS sites, and in ensuring that all designated climate sites had GPS location. Nevertheless, the Committee noted that there was a need for GLOSS to further ‘chase’ the non-reporting countries in the GLOSS community to ensure that delivery of data from GLOSS stations to the PSMSL was improved.

The Committee noted with appreciation the contributions by several Member States to the success of the GODAE Programme.

Appreciating the presentation of how things had developed over the past 10 years, the Committee expressed the need to see some projection of these trends as a means of seeing where the system might be headed over the next 10 years. The Committee requested OOPC to develop a process to refine the present set of recommended next steps to reach implementation of the initial ocean climate observing system as new information is obtained via modelling and observations of the global ocean. This would guide the necessary investment.

With these caveats the GSC fully endorsed the continued development of the integrated observing system.

Action 12: GSC requests through I-GOOS-VI to the IOC Assembly that Member States take the actions, described below, to implement fully the initial global ocean climate observing system agreed at and subsequent to the OceanObs99 conference, namely:

- (i) to follow the recommendations and take action to increase the number of surface drifting buoys to 1,250, of repeat SOOP XBT lines to 41, of geocentrally located tide gauges to 86, of ocean reference time series stations to 29, of Argo profiling floats to 3,000, of VOSCLIM ships to at least 200, of tropical surface moorings to 119 and to carrying out the agreed repeat hydrography and carbon content and surface carbon flux

survey projects, which are the key *in situ* observing elements of the agreed initial global ocean climate observing system;

- (ii) to participate fully in ocean data archaeology efforts, in free and open exchange of contemporary data, and in support of the development and use of modern data communication, access and serving technology, which comprise the data system component of the agreed initial global ocean climate observing system;
- (iii) to support the Global Ocean Data Assimilation Experiment and other ocean climate analysis activities, which comprise the ocean climate product component of the agreed initial global ocean climate observing system;
- (iv) to implement the agreed ocean reference sites within the framework of the GEO project, recognizing that they are a key link between the initial global ocean climate observing system and the development of sustained observing in support of the biogeochemical and ecosystem communities.

Action 13: Through the CEOS representative to the GSC, GSC requests the agencies involved in CEOS and IGOS-P to take steps to provide for the continuation of climate quality ocean surface altimetry, ocean colour and surface vector wind missions, which are the key satellite components of the agreed initial global ocean climate observing system.

Action 14: GSC requests the OOPC to undertake the following actions:

- (i) to foster development of an ongoing observing system evaluation and evolution activity, in recognition that much will be learned as the initial global ocean climate observing system provides more complete information than has been available previously, and that specific observing system activities should be adjusted in reaction to new knowledge and to new technology;
- (ii) to develop recommendations for an activity to ensure that operational flux fields will be stored and made available for comparison with each other and with high quality *in situ* observations;
- (iii) to carry out a review of the global surface drifting buoy programme and formulate recommendations to maximize the utility of this programme;
- (iv) to expedite its efforts to develop a set of ocean climate indicators with associated observing system activity needs;
- (v) to work with WCRP to review the state of climate-related sea ice analysis capability, with appropriate specialist groups, and recommend any needed actions for improvement;
- (vi) to review the trends in subsystem development with a view to developing a 10-year development profile for each as the basis for identifying priorities for investment.

Action 15: GSC requests the OOPC and COOP to formulate a joint pilot project to make use of GODAE products and shared technology.

Action 16: GSC requests JCOMM Management Committee to take actions to identify the reasons why many *in situ* data are not being sent to the relevant international archives, and to take action wherever possible to use the resources of the larger *in situ* community to assist the nations in bringing their data to the archives. As an immediate action it is requested that this be brought to the attention of the GLOSS group of experts.

Paul Mason described the ocean contribution to the Adequacy Report on Observing Systems that is being presented by GCOS on behalf of GOOS and others to the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC) (background document GSC-VI/B12). Work on the Adequacy report will continue with the assistance of the OOPC in Geneva in March 2003, prior to submission of the final version of the Report.

Action 17: Members to provide Paul Mason before 7 March 2003 with any suggestions they have to improve the presentation of the ocean component of the Adequacy Report.

The Committee noted and commended the considerable progress being made by the OOPC and by its pilot programme areas, GODAE and Argo, and endorsed OOPC's plans.

6. IMPLEMENTATION OF GLOBAL GOOS DESIGNS

6.1 *IN SITU* OBSERVATIONS

Peter Dexter (WMO Marine Programme) reported on progress with JCOMM, providing a verbal report on the outcome of the second JCOMM Management Committee Meeting (Paris, France, 5-8 February 2003), and a synthesis of the year's activities (background document GSC-VI/B13). He drew attention to the ways in which JCOMM provides much-needed infrastructure for GOOS and GCOS, for example through actions being undertaken by JCOMM subsidiary or reporting bodies such as DBCP, TIP, SOOPI, GLOSS etc. He noted that JCOMM-CB was addressed under agenda item 4.1, and JCOMM-DIM would be addressed under agenda item 6.3.

He drew attention to the activities of the Expert Team on Maritime Safety Services (MSS), which has recently undertaken a review and tuning of the marine broadcast system for MSS, established a website for global real-time MSS, planned for graphics broadcasts under the GMDSS, enhanced coordination and streamlining of NAVTEX services, and undertaken a review of user surveys.

The Expert Team on Sea Ice has developed an overall strategy for operational ice observations, DM and services, implemented a colour standard for ice charts and developed new ice nomenclature, as well as undertaking a review of the GDSIDB.

DBCP held its annual technical workshop. Its work is focused through the JCOMMOPS/technical coordinator. A new action group has been created in the North Pacific (with PICES), and other action groups continue active regional deployment programmes. Action was taken to restore real-time data download facilities, and to maintain a Southern Ocean drifter programme. Ongoing concerns/issues include: (i) vandalism; (ii) new communications facilities (iii) buoy technical developments; (iv) maintaining funding for the technical coordinator.

Associated with the Data Buoy Cooperation Panel meeting was the Joint Tariff Agreement (JTA) meeting, which achieved continuation of the Argos finance plan, with no change in base tariff.

The Management Committee had held its second meeting. It reviewed the activities of the Programme Areas, with decisions on specific issues including: (i) Enhanced coordination with OOPC on data requirements; (ii) Enhanced coordination with IODE; (iii) Merging of JCOMM and GOOS CB; and (iv) 2004 workshops. The meeting agreed on a logo and a booklet, development of a strategic plan, new membership of the MC, and an approach to non-physical data.

Several meetings of different specialist areas are now planned for 2003–2004, including the CLIMAR-2 and Brussels 150 meetings in Brussels, in November 2003.

A Task Team has been created on Development of New Products. The membership is nearly finalized, and will include the chair of OOPC.

The JCOMM Electronic Products Bulletin is valuable, as evidenced by usage to date, and is complementary to the GOOS P&S Bulletin. It needs long-term support in an operational environment. Yves Tourre will prepare a prospectus to canvas for such support among operational agencies.

JCOMMOPS presently supports DBCP, SOOPIP and Argo. It comprises a 2-person team, which supports a relational database (metadata only) and links data providers, data centres and operational centres. It provides direct technical support on data collection and distribution, and has potential for support to other components of the SOT (VOS, ASAP).

Action 18: GSC requested OOPC to work with the JCOMM Observations Coordination Group (OCG) to develop a mechanism for coordinating observational data requirements with implementation mechanisms.

Action 19: GSC accepted the invitation to co-sponsor the JCOMM ad hoc Task Team on the Development of New Products and Services, and called for membership nominations from COOP and GODAE.

Action 20: GSC agreed with the proposal from the JCOMM Management Committee to work towards the merger of the JCOMM CBCG and GOOS CB Panel; action to draw up a merger plan to be taken by JCOMM CB Coordinator and GOOS Panel chair, for MAN-3 and GSC-VII.

Action 21: GSC to request JCOMM to invite the JCOMM TT on resources to support GOOS also.

Action 22: GSC agreed to the request from JCOMM to participate in the work of GOOS to develop a communications strategy, which could then also be used as the basis of a related JCOMM communications strategy, and requested JCOMM to nominate one or more members to the communications working group.

Action 23: GSC agreed to co-sponsor the Ocean Products Workshop, May 2004 (no financial implications), and requested OOPC and the GOOS Regional Forum to provide representatives on the organizing committee.

The Committee noted that in order to facilitate the development of strong links between JCOMM and COOP, Dr. Tony Knap (COOP Co-Chair) had been appointed to be the JCOMM Rapporteur for COOP.

The Committee noted and endorsed progress with JCOMM.

6.2 THE OCEAN THEME—ROLLING REVIEW PROCESS FOR SATELLITE REQUIREMENTS

Colin Summerhayes briefed the Committee on interactions with the Integrated Global Observing Strategy (IGOS) Partners (background documents GSC-IV/B14, B15 and B16), noting that GOOS was responsible for oversight of the implementation process under the Oceans Theme of the IGOS Partnership. The Oceans Theme document was published in January 2000. It had been agreed that after three years (i.e. in 2003) there would be a review of progress in meeting the goals

set out in the Theme, and a review of the changing requirements of the user community, as the basis for revising the Theme. It has subsequently been agreed that the review should follow the process used by the WMO Rolling Reviews. Peter Dexter roughly outlined this process for the GSC.

Colin Summerhayes noted that slow progress was being made by the IGOS Partnership with the development of the Integrated Global Carbon Observing (IGCO) Theme of the IGOS Partners. The Committee noted that a plan for the ocean component of the IGCO had already been published as a GOOS Report (No. 118) (<http://unesdoc.unesco.org/images/0012/001270/127070e.pdf>). The oceans group responsible for that report was waiting for the IGCO team to engage them in developing the fully integrated Theme plan.

Tom Malone reported on progress with the development of a newly proposed IGOS Coastal Theme. A meeting to begin outlining this new Theme had taken place in Washington DC in January 2002, and an initial plan would be presented to the next meeting of the IGOS Partners (June 2003).

In discussion, the Committee noted that Eric Lindstrom, the CEOS representative on the GSC, would be the link between the IGOS Coastal Theme and the IGOS Oceans Theme, to ensure harmony in the requirements for remote sensing between the two themes.

Action 24: GSC requests IGOS Partners, through the CEOS representative to the GSC, to ensure adequate linkage between the requirements for remote sensing identified by the Oceans and Coastal Theme Panels.

Action 25: GPO and Eric Lindstrom to work with OOPC, COOP, JCOMM and the GRAs to carry out the rolling review of Ocean Theme by year end 2003.

The Committee noted and endorsed these various developments.

6.3 DATA AND INFORMATION MANAGEMENT

6.3.1 JCOMM

Peter Dexter reported on the way in which data and information management is being handled within the JCOMM Data and Information Programme Area (background document GSC-VI/B17).

The JCOMM DM Coordination Group (CG) takes an integrated and mutually supportive approach to DM, using its own efforts and those of two Expert teams, coordinated closely with IODE. The CG met in May 2002 in Paris and developed plans to draft a DM strategy for JCOMM, encompassing ocean and met data, and implement pilot projects. It is undertaking a study of metadata systems, coordinating with CBS on issues such as FWIS, data exchange formats, etc, and will be identifying a centre to host the ODAS metadata base.

The JCOMM DMCG has been involved in the development of the OIT, and with the Colour of Ocean Data meeting in Brussels (25 to 27 November 2002):
(<http://ioc.unesco.org/iode/contents.php?id=120>).

Peter Dexter noted the development of GOSUD, an IODE project that is directly relevant to JCOMM, and which will deal with non-standard, non-physical variables, in connection with SOT and COOP. GOSUD held its first project meeting in Ottawa in September 2002, and developed a work plan to be reviewed at IODE-XVII (3–7 March 2003).

DM was considered in detail at JCOMM MAN-2. Collaboration is close and increasing between JCOMM and IODE. There is a need for further integration to enhance economies, though no major changes before the IOC's review of how it can integrate data and information management across the IOC (between GOOS, IODE and JCOMM). The JCOMM-MC recommended (to be presented to IODE-XVII by Savi Narayanan):

- (i) IODE Secretariat should be part of the JCOMM Secretariat and assume responsibility in IOC for JCOMM DM;
- (ii) JCOMM ETDMP and IODE GE-TADE should merge;
- (iii) JCOMM and IODE should co-sponsor the OIT project, Marine XML, GOSUD, and biological/chemical DM.

Action 26: OOPC to work with International Time Series Science Team and JCOMM to develop a data and information plan.

6.3.2 GOSIC

Worth Nowlin briefed the Committee on progress with and plans for the Global Observing Systems Information Centre (GOSIC) (working document GSC-VI/17). GOSIC provides user-friendly access to hundreds of distributed databases and products of the three observing systems. The data are maintained in the centres and accessed through GOSIC, which provides an integrating overview of three diverse but complementary observing systems, and documents the data management systems that comprise the G3OS data systems, as well as providing information on observing requirements, planning documents, scientific justifications, data flows, etc.

GOSIC is currently operating under a 3-year grant from NOAA, and is in a development phase that will be completed in 2004. A further 2-year grant will be needed for the transfer phase, for final development and to implement transfer. After completion in 2006, the activity should ideally be transferred to an operational agency.

Since GSC-V, GOSIC has reviewed and documented 40 new G3OS elements, with 90 additional database links. It now has over 300 pages with 120 database links. It has created data access and programmed description pages for each item. The priority is to assist users to find data and information. There is a new database for searches by programme element (e.g., GLOSS), and searches may be made across the three programmes. There were 50,000 site visits in 2002, including repeat users, during which, over 900,000 pages were viewed from more than 100 countries (for access see www.gosic.org).

GOSIC now requests from GSC improved linkages and guidance so that it can respond effectively to programme needs. The mechanisms are missing to communicate the needs of all G3OS panels and committees.

The G3OS should agree between them to arrange another review of GOSIC, with a report by end of 2003, in time for the proposal to be developed for the funding cycle. The GSC should recommend a chair and members for the review team. The G3OS should also specify what process should be used to seek an agency to operate GOSIC from 2006 after development at the University of Delaware is complete.

The GSC endorsed progress with GOSIC, and considered that the same GSC representatives should be used for the next GOSIC review as were used for the last one.

Action 27: GSC Members to send to the GPO suggestions for the names of possible chairs for the GOSIC review by end April 2003.

Action 28: GPO to arrange the second review of GOSIC during 2003, in concert with GCOS and GTOS.

6.3.3 The Ocean Information Technology Project

Worth Nowlin also reported on the results of the first meeting of the Steering Team of the Ocean Information Technology Pilot Project (OIT), which took place in Brussels on 29 November 2002) (background document GSC-VI/B18). He reminded members that the objective was to approach OIT as one would a Science Programme, addressing the demand for effective telecommunications; the need for common standards, practices and protocols (metadata management); the need for data and product service matched to the participants and users of GOOS data; the need for innovative data inquiry, access and delivery mechanisms; and the need for intra-operability and interoperability.

The Brussels meeting provided a strong and unanimous mandate to proceed with the OIT Pilot Project, with a focus in terms of capacity and functionality. The OIT must remain focused, and work within a common framework with IODE, JCOMM and GOOS. Common themes at the meeting were the need for people and investment in systems; the need for innovation, to be worthy of investment; the recognition that technology is not a first order limitation; and the recognition that open source systems are important for interoperability.

Several building blocks are already in place. Strong links must be developed between national/regional initiatives and the OIT, and the plans for OIT should take advantage of existing national activities and relevant international activities. In terms of leadership and building on strengths, the US DMACS is at the leading edge of data transport and communications and possibly provides a basis for OIT; Argo and WOCE have been path-finding in terms of data assembly and quality control and could provide a basis for these aspects in OIT; and there are several sources of experience for metadata management (WOCE, Argo, DODS/OPeNDAP and other DMACS partners), together with groups like IODE/ICES SG-XML.

A lot of work is needed on metadata standards and models. It will be important to initiate an OIT Metadata Management Project. Leadership for the project would be drawn from the ETDMP and relevant IODE projects and, to the extent possible, would be consolidated under a single joint initiative. The short-term goal is to bring together a team to develop this Project (order 4-6 months). The medium-term goal is to convene a Workshop around 10-12 months from now. Initial agreement would be reached on the "standard". Several separate Task Teams would examine different aspects and features of the "standard" and issues related to compatibility. The Workshop should have at least 4-6 months preparatory time.

Other high priority issues include data circulation and service, data circulation and communications, and data assembly, quality control, and data set integrity.

While recognizing the many challenges that still lie ahead, the GSC accepted that there was a need to change the present approach, and agreed that the OIT Project was a highly innovative way of tackling this important issue. The GSC approved and endorsed the OIT pilot project and wished its authors success.

6.3.4 The GOOS Data and Information Management Plan

Finally, Prof. Nowlin provided a view on the extent to which the GOOS Data and Information Management (DIM) Plan (GOOS Report 103) is being implemented, and advised the committee on what still needs to be done to create a visible and accessible data and information management system for GOOS. The DIM Plan was produced in 2001, so is still relatively new. The Plan recommended that the system should be highly distributed and accommodate all types of *in situ* and remotely sensed data and products. Improved management of GOOS data and information should begin by connecting existing ocean observing system elements that contribute to the GOOS requirements. The system should develop in an iterative fashion, with additional elements added as requirements develop. New observing system elements likely will be implemented through the use of pilot projects. Data management of these new elements should be developed in parallel with (as part of) the pilot projects.

The Plan had recommended maintaining the latest information on GOOS services and programmes via a website (this is GOSIC), and maintaining a website that gives users information connecting the GOOS programmes to participating data centres, and that gives a source to data holdings or to the data holder for each of the GOOS elements. GOSIC also is designed to do this.

The Plan also called for GOOS to develop and maintain a carefully designed, automated tracking system for the data and information so that it can be demonstrated that the system is working, or if not where the problems lie. Bert Thompson has been addressing this issue as a part-time consultant to GOOS. He provided a status report for GSC-VI under agenda item 7.4 (below).

The Plan required enhanced cooperation between GOOS and other intergovernmental data management systems, particularly the IODE. Progress is being made through cooperation between JCOMM and IODE.

The Plan called for GSC to develop an effective Capacity Building Programme in the area of data management. As reported under agenda item 4.1, the GOOS CB Panel has made DIM a high priority.

The Plan called for support for an Ocean Information Technology Project as a mechanism for the development of advanced technologies in ocean data management. The Project is now being developed.

The Plan was to be revised on a regular basis and maintained on line. It is maintained on line as the GOOS Report (accessible through the GOOS documents list).

The GSC noted progress and agreed that, while the Plan should be revised on a regular basis, it was too soon to undertake a first revision.

The Committee agreed that emphasis should be placed increasingly on the collection and exchange of data in real time.

6.4 INDICATORS

Mike Sinclair reported on the progress of an inter-sessional working group against GSC-V Action 17, *to review the status of indicator development and operational use, develop requirements for indicators, identify user groups, and develop a plan for identifying and incorporating indicators as GOOS products* (working document GSC-VI/18).

The draft report considered potential indicators for a single coastal regional sea, the Gulf of Maine area. It is expected that some generic insights may emerge from a detailed analysis of this regional coastal sea.

Given that the study area is a shelf sea, the six goals of the coastal module of GOOS are of particular relevance. The goals of “reduction of public health risks”, “protection and restoration of ecosystems”, and “restoration and sustainability of living marine resources” were grouped by considering the indicator needs for the broad conservation objectives of integrated management/so-called ecosystem-based management.

Indicators for the goals of “safety and efficiency of marine operations” and “the control and mitigation of the effects of natural hazards” were also combined. Indicators for the “detection and prediction of the effects of global climate change on coastal ecosystems” (the third goal of coastal GOOS) were considered separately.

Indicators should relate to the objectives of coastal zone and shelf seas management, or to decision-making by individual ocean users. The report summarizes the expected common set of overarching conservation objectives for diverse regulatory plans in this geographic area (e.g. oil/gas, mineral extraction, cables, marine transportation, aquaculture, eco-tourism, waste disposal and fisheries). The conservation objectives are expected to include statements on biodiversity, productivity and marine environmental quality. Examples of indicators (and reference points for decision making) are categories of conservation objectives of ecosystem-based management.

The safety and efficiency of marine operations depends primarily on conditions at the surface of the ocean. Examples of key measurements and forecast products related to marine safety and efficiency are provided. Mitigation of natural hazards requires accurate observations of and forecasts of winds, waves, surface currents and water level. Examples of indicators are provided.

Given that the Gulf of Maine is a relatively open system, for climate change issues understanding the connections between the boundary fluxes and the internal state of the Gulf is at the heart of the proposed indicators for this regional sea. A wide range of indicators of climate change in the Gulf are discussed.

The report concludes with a short discussion of the delivery of indicators to the user community. The several categories of indicators require a different process of delivery. State of the ecosystem reporting is one mechanism for providing an overview of a broad range of indicators for several of the goals of Coastal GOOS.

It is expected that the Gulf of Maine Area COOP-GOOS pilot project will provide some examples of both the selection of indicators for the diverse goals of COOP-GOOS, as well as trial delivery mechanisms. Linkages with GODAE products are proposed.

The Chairman congratulated the Indicators Working Group on the thoroughness of their report, and stimulated a discussion on the importance of indicators and on how we could and should use them to make our case to decision makers. To illustrate what GOOS should aim for, he cited the example of the indicators pages on economic trends that are to be found at the back of The Economist magazine. Something similar is needed for the environment.

UNEP noted that indicators are important elements of their Global Environment Outlook reports, number 3 of which was published recently.

Following an extended discussion, the GSC agreed the following actions:

Action 29: (i) The Working Group on Indicators to continue its work to finalize the present draft and present it to GSC-VII; (ii) GSC to establish collaboration with UNEP's DEWA to discuss development of indicators for coastal and marine assessments, under the framework of UNEP's GEO-4 process and reporting; (iii) GPO and GSC Members to work together to develop a page of indicators that can be placed on the GOOS website; (iv) Franciscus Colijn to provide Members and the GPO with copies of the recent Dutch study on marine indicators.

7. REGIONAL/NATIONAL GOOS DEVELOPMENTS

7.1 REGIONAL GOOS ALLIANCES – REPORT ON FIRST REGIONAL GOOS FORUM

Silvana Vallerga provided a brief report on the outcome of the First Regional GOOS Forum (Athens, 2–6 December 2002) (background document GSC-VI/B19). She noted that bringing the GRAs together had enabled them to learn from each other's experience, to learn about best practice, and to start building a network. The meeting had been timed to run in parallel with the EuroGOOS Conference on Operational Oceanography so as to learn specifically about the latest developments in operational oceanography, as well as the best practice in Europe. The meeting participants had agreed to collaborate on developing the GRAND proposal for the EC's FP6 (see agenda item 2.2).

Good progress is being made in all areas, though some have more difficulty than others in taking GOOS developments forward. Particularly significant regional developments since GSC-V (May 2002) include: (i) the finalization of the WIOMAP proposal (Mauritius, 1–2 November 2002); (ii) holding of the first IOGOOS Conference, and signing of the IOGOOS MOU (Mauritius, 4–9 November 2002); (iii) holding of the third EuroGOOS Conference on Operational Oceanography (Athens, 3–5 December 2002); (iv) funding of Black Sea GOOS by the European Commission; (v) acceptance of GOOS-AFRICA's proposals as a key part of the New Plan for African Development (NEPAD), and (vi) plans being made for the development of a GOOS Regional Alliance for the south-eastern Pacific (June 2003).

Other regional interactions include those with ICES for the North Atlantic and PICES for the North Pacific.

Action 30: (based on old Action item GSC-V.31): GPO will work closely with the ICES-IOC Steering Group on GOOS (at its next meeting in Nantes, April 2003) to see how ICES can help take forward COOP and OOPC initiatives and vice versa, as a prelude to consideration of the development of an Atlantic-wide multi-community approach to GOOS that would build on and complement ongoing developments involving GODAE, EuroGOOS, US and Canadian agencies. One possible outcome may be arranging a meeting of all the different North Atlantic operational, modelling and research groups to aim at the development of a comprehensive and integrated observing system for the region.

Action 31: (based on old Action item GSC-V.32): Tom Malone will identify a COOP representative to explore with PICES the possibility of developing a joint GOOS and PICES approach to ocean observations in the North Pacific, including the possibility of establishing a regional GOOS office for the North Pacific.

The Committee noted and endorsed developments.

7.2 COORDINATION WITH OTHER REGIONAL ACTIVITIES (UNEP, FAO, LME)

Colin Summerhayes reported briefly on interactions with the UN Regional Seas Programme (RSP), with FAO, and with the Large Marine Ecosystems (LME) Project Management Team. Individual GRAs are now forming close links with the relevant UNEP RSPs in their areas. FAO continues to be engaged in the development of COOP plans, as does UNEP. GOOS-AFRICA is considering how it may interact yet more closely with the LMEs developing around Africa, so as to ensure that GOOS provides a tool for LME development. This will likely enable funding of GOOS elements by the GEF under the LME programme. GOOS-AFRICA and the GPO will both be making presentations at the next meeting of the LME Management Committee (Paris 3–4 March 2003).

The Committee noted and endorsed these developments.

7.3 IOC-GOOS REGIONAL OFFICES

Bill Erb reported on progress with and plans for the Perth Office (background document GSC-VI/B21), and Ms. Janice Trotte reported on progress with and plans for the Rio Office (background document GSC-VI/B22).

The Committee noted and endorsed progress.

7.4 NATIONAL GOOS DEVELOPMENTS

Worth Nowlin reported on progress in and plans for obtaining details of national commitments to GOOS. This work has been carried out by Bert Thompson, operating under contract at the University of Delaware (background document GSC-VI/B23) as a follow up to the Initial GOOS Commitments meeting of July 1999 at which a number of Member States had made specific commitments. In addition to these, the GPO received annual reports from Member States on their GOOS activities. It was important to qualify and quantify these and make them widely available as an indication of an additional element of GOOS. Thus far these analyses had not been made. Bert had therefore been tasked to document activities offered by Member States and international agencies as commitments to GOOS; assess the extent to which the observing systems offered met GOOS principles; determine where the delivery of data or products has diminished or ceased; and when delivery had diminished, contact providers to determine why and establish possible remedies.

Mr. Thompson had examined a number of published national reports through 2002, and made many individual contacts, including using a questionnaire to elicit specific information. Reports included those from GOOS Participating Members (71); Members submitting reports (40); National profiles prepared (21); Profiles sent to National Contacts (16); and National Contacts providing feedback (7).

In examining these reports he had noted the following trends in data delivery: (i) XBT data were down 30% (1999–2001); Drifter data were down 25% (2001–2002); Argo was up over 100% in 2002; and Sea-level data were down 5% since 1997.

Action 32: (i) The trends noted by Bert Thompson's review of national inputs need to be cross checked by the JCOMMOPS Centre; (ii) JCOMMOPS should be providing regular statistics to JCOMM and GOOS on system performance.

Action 33: GSC requests JCOMMOPS to develop a method for demonstrating the volume flow of data over time.

Action 34: Silvana Vallergera, GPO and Bert Thompson to develop a proposal for consideration at the I-GOOS-VI meeting in March 2003 for a mechanism for compiling and analysing all national contributions to GOOS, based on national surveys in progress in the Mediterranean, including the data collected by GRAs, so as to be able to provide comprehensive reports on the status of the observing system.

The Committee noted progress.

8. COMMITTEE BUSINESS - A

8.1 REPORT OF SESSIONAL WORKING GROUP ON PROGRAMME AND BUDGET, AND APPROVAL OF WORK PROGRAMME AND BUDGET

Ralph Rayner delivered the output of the sessional working group on programme and budget. The WG noted that the work programme follows accepted priorities, with major effort in supporting capacity building (32% of the budget). The WG noted that the Secretariat proposes to spend 70+ days attending meetings, and suggested that it might be possible to reduce this to free up time for other activities (perhaps through using GSC members to report meetings through the Secretariat).

Given the discussions that had taken place up to the conclusion of the second day of the GSC meeting, the WG noted the need to add certain items. These include: (i) half a person year input to support capacity building; and (ii) increased support to an increasingly active GOOS infrastructure. Adding these would unbalance the budget. They must be funded either through redistribution of present resources or increased funding.

With regard to the funding base, the WG noted that there was no indication of future secured funding levels in the present budget. They also noted that >60% of programme funds come from outside IOC, and asked how sustainable this was, and what other external sources could be accessed.

Regarding sources of funds, the WG noted that the financial needs are very modest (currently approx \$2M/annum if the \$1 million salaries budget is included). It should be possible to increase resources significantly through secondments and by seeking other external funding sources. New support might be obtainable for example through: (i) EC secondment/placement programmes (and equivalents in the US and elsewhere?); (ii) aid agencies (especially for capacity building support); and (iii) charitable foundations.

The GSC endorse the present programme and budget and adopted the following actions based on the WG recommendations:

Action 35: (i) the GPO should review more cost effective way of covering the growing number of GOOS related meetings; (ii) the GPO should investigate secondment possibilities and broader base of external funding; (iii) a forecast of future secured funds should be presented to each GSC meeting; and (iv) the GSC should make strong representation to IOC on the need for continuity in the role of the head of the GPO.

Ralph noted that the present profile of GOOS is very weak; GOOS needs to think big and act big. A budget of \$54k for outreach is woefully inadequate, particularly when most of it is spent on preaching to the converted.

Action 36: The GSC formed a small inter-sessional group to comprise Ralph Rayner (chairman), Tony Knap, the Director GPO and other members as appropriate, to draft a Development Plan and to report back to GSC-VII.

8.2 REPORT OF SESSIONAL WORKING GROUP ON CAPACITY BUILDING, AND AGREEMENT ON ACTIONS REQUIRED IN CAPACITY BUILDING

Helen Yap reported on the results of the deliberations of the Sessional Working Group on Capacity Building, which she had chaired. The WG had focused on three main issues: (i) location of Capacity Building effort within GOOS; (ii) assigning short term priorities for capacity building strategy within the GSC; and (iii) writing a duty statement for the new IOC capacity-building staff member who will (ideally) spend 50% of his/her time on GOOS CB.

(i) Location of Capacity-building effort within GOOS

As a guiding principle, the WG agreed that capacity building would be most efficient within the context of the implementation of GOOS regional alliances (GRAs). In this regard, it is essential that I-GOOS recognises and supports GRAs. The WG also supports the merger of the CB Panels of GSC and JCOMM (see action 36, below). Within this context:

- There is a need to maintain a CB effort within the GSC via its involvement in a merged GSC-JCOMM CB Panel. The objective of the GSC's CB effort should be to outline the capacities required, and to charge the GPO with the development of "toolboxes" and other materials to aid implementation of these capacities. Examples of potentially useful materials include:
 - a web portal (gateway to internet based information sources) to provide a comprehensive information resource of ocean activities relevant to GOOS capacity development, making use of IODE's dynamic content management system and Ocean Portal.
 - a set of "Start up packs" following the example provided by the IODE Resource Kit and focusing on operational oceanography.
- The strategy should also focus on establishing a template for capacity building within a GRA, including assessment of existing capacity and identification of specific needs.

The WG recognized that JCOMM would oversee the actual implementation of the CB strategy developed by GSC. This is envisioned to occur through the gradual handing over from GSC to JCOMM of particular capacity building activities as they become operational.

The focus of CB strategy within I-GOOS should be to identify national and regional needs' priorities and assets, to promote cooperation to address the specific capacity-building needs and priorities, and to identify resources at the national and regional level.

(ii) Assign short-term (6 months to 1 year) priorities for capacity building strategy within GSC

The WG made the case for creating a register of existing capacity building efforts including those of related programmes – organized in the context of GRAs—and for creating a register of potential sources of funds for capacity building.

(iii) Write duty statement for new 50% GPO person

The WG gave some thought to how the 50% of the IOC's CB post (TEMA) should be used on behalf of GOOS (see action 7, above). It considered that the post holder should undertake the two short-term priorities listed in item 2 (above) (registers of existing capacity and of funding sources) in two GRAs:

- one with some existing capacity — e.g. Western Indian Ocean;
- one with very little existing capacity — e.g. South Pacific island nations.

These efforts are to serve as demonstration projects in capacity building.

The post holder should also develop a “web-portal” for GOOS related activities.

The Committee commended the Working Group on its report, and suggested the following actions:

Action 37: Merge the GOOS and JCOMM CB Panels, following the requirements and strategy noted in section 8.2 above.

Action 38: New IOC capacity building person to create registers of existing capacity building efforts (including those of related programmes—organized in the context of GRAs) and of potential sources of funds for capacity building.

Action 39: The Chair of the GOOS CB Panel or his representative should report on progress and plans to I-GOOS and be part of the Regional GOOS Forum.

8.3 SUGGESTIONS FOR OUTREACH AND COMMUNICATIONS

Narayana Swamy reported on the progress of an inter-sessional working group against GSC-V Action 15, to develop a communication strategy for GOOS (working document GSC-VI/19). The Working Group comprised: James Baker, Geoff Brundrit, Johannes Guddal, Tony Knap, Jose Muelbert, Peter Pissierssens, Neville Smith, Narayana Swamy (Chair), and Helen Yap. Valuable inputs came from Julie Hall, Laura and Worth Nowlin, and Colin Summerhayes. Given those recent inputs, the working paper (GSC-VI/19) was now in effect out of date, and the presentation was based instead on the new inputs.

The vision of the Communication Strategy should be: “Ocean information from all, ocean information for all, for a vibrant life-supporting ocean and an ocean-enabled global community”.

The challenge is: *How to reach out to the target communities with the increasing data and information regarding the ocean, and the changing technology of communication?* This is a critical component that has thus far been largely overlooked; it may even prove to be the key to the success of GOOS, reflecting the observation of Korzybski, one of the founding fathers of Communication Theory, that *The longest and most difficult distance in transmitting information is the last half inch between a man's ear and his brain.*

The GOOS Communications Mission should be *To lend communications counsel, assistance, services and products in support of the GOOS mission to provide accurate descriptions of the present state of the oceans, including living resources; continuous forecasts of the future conditions of the sea for as far ahead as possible; and the basis for forecasts of climate change.*

The approach covers (i) bottom-up capacity building; (ii) a pan-media strategy; (iii) decentralized but not disjointed communication channels; (iv) brand equity; (v) initial Public Relations outfit [GOOS Mechanisms for Advocacy and Communications Support (GMACS)]; (vi) multi-language releases; (vii) rapid-response communication; and (viii) sustained funding.

The key audiences for GOOS communications are considered to be as follows:

- Opinion leaders and decision makers:
 - Non-governmental organizations (Environmental activists, Public Interest groups, Welfare societies, Cooperatives);
 - Government officials (Planning, Science & Technology, Finance, International affairs, Commerce, Services).
- Planners and implementers:
 - Agencies, Nations and Regional Alliances making GOOS;
 - Observations (Governmental Agencies, National GOOS Committees, Science Foundations, Science Academies, R&D Institutions, Universities, GRAs).
- Potential donors:
 - Foundations, monetary funds (international banks), governmental agencies able to support GOOS infrastructure and capacity building (GEF, Rockefeller, Sir Alister Hardy, NSF, etc.; IMF, WB, ADB, etc.; EU/FP6, CSC, NASA, NOAA, DANIDA, NORAD, SIDA, JAMSTEC, OAU, CARICOM, etc.).
- Users:
 - Recipients of data, products and services, including UN Conventions (Planners, Researchers, Academia, Service providers, Analysts, Opinion makers).
- Public:
 - Beneficiaries (Maritime communities, Fisher folk, General public, Mass media).

Potential GOOS media and captive audiences were considered to be:

Media	Audience(s)
BROCHURE (T. KNAP)	Governmental agencies, Planners, Decision makers, Donors, Users, Industry, Researchers, Academia, Institutions, Opinion makers.
BIENNIAL REVIEW (N. SMITH)	UNESCO/IOC bodies, Member countries, Governmental agencies, GOOS functionaries, GRAs, Sponsors and donors.
Products & Services Bulletin (J. Guddal)	Users, Researchers, Academia, Industry, Sponsors & donors, GOOS planners and implementers.
GOOS Newsletter (C. Summerhayes)	<i>(All above).</i>
IOC/GOOS Website (C. Summerhayes)	<i>(All above, with Internet access).</i>
GOOS 1998+ Document (C. Summerhayes)	<i>(As in Products & Services Bulletin).</i>
Press Releases (IOC/UNESCO)	Users, Governments, Public, Students.

Media	Audience(s)
Radio Broadcasts (IOC/UNESCO)	Public, Students.
Television Programmes (IOC/UNESCO)	Public, Students, Users.
Lectures/Presentations (GOOS Ambassadors)	Decision makers, Specialists, Public, Students, Users.
Exhibitions/Posters (GOOS Representatives)	Public, Students, Users, Specialists.
Help-line Desk (?)	(Anyone interested).

Some GOOS Messages considered were:

General	Specific
Oceans Unite the Nations	GOOS for Ocean-enabled Global Community.
One World, One Ocean	Global Ocean Observing System – Global Nation Enabling System.
One Planet, One Ocean	GOOS Community for Global Prosperity.
Save Our Seas	GOOS Today for a Better Tomorrow.
Ocean – Our Last Frontier	Ocean information <i>from</i> all, ocean information <i>for</i> all, for a vibrant life-supporting ocean and an ocean-enabled global community.
The Oceans – Our Common Heritage	Dwindling Ocean, Dwindling Nation; Vibrant Sea, Global Prosperity.

The strategy should include some Long-Range GOOS Communication Goals and Short-term Objectives, among which could be:

Goal I: Implement a professional infrastructure for GOOS communications.

Objective 1: Initially, establish a group consisting of GOOS/GSC members, technical advisors/editors and consultants (communication experts, visualisers, multi-media specialists, multi-language specialists, etc.) to oversee production and dissemination of communication products and services.

Objective 2: When funds are available for this purpose, create a Communications Office staffed with a professional communicator/writer/editor, graphic artist and web support technician to assume responsibility of GOOS public relations activities.

Goal II: Enable under-privileged user groups to get and use GOOS information regardless of technological sophistication, economic status or geographic location.

Objective 1: Recognise that communications is a part of Capacity Building and Data and Information Exchange, since any level of communication technology will be ineffective if the target user group is not empowered to absorb it.

Objective 2: Facilitate infrastructure and training, and technology upgrades on a continued basis until a global threshold is attained.

Objective 3: In consideration of the discrepancies in the levels of technological sophistication among user groups around the world, issue print news releases and other mass-media products in a timely manner until such time as the discrepancies are ironed out.

Goal III: Provide efficient and timely communication with key audiences and user groups.

Objective 1: Prepare communications products following a multi-media approach, which spans the spectrum from low-tech (e.g. print media) to high-tech (e.g. new media – Internet, Web) and all technologies in between (e.g. radio, television).

Objective 2: Prepare and release GOOS information in multiple languages and to appropriate media outlets worldwide.

Objective 3: Keep the existing GOOS website up-to-date so that it reflects GOOS activities and accomplishments on ‘now-time’ basis.

Objective 4: Ensure simultaneous updating of information across all the media of GOOS communication.

Goal IV: Act as a feedback/corrective mechanism for the success and failure perceptions of GOOS.

Objective 1: Watch public responses and conduct periodic opinion surveys, and advise GOOS management appropriately.

Goal V: Build public image and achieve global positioning for GOOS activities.

Objective 1: Keep the relevant “messages” and essential “brand equity” always in focus.

Objective 2: Explore and capture opportunities for lectures/presentations/exhibitions/demonstrations at captive *fora*.

The Working Group recommended that the following actions be considered in taking the strategy forward:

- (i) Deliberating the communications strategy in a wider forum and with related bodies, and evolving a consensus on establishing a G-MACS/PR outfit.
- (ii) Comparing the communication strategies of other international initiatives, and deriving the best from the successful ones (e.g. IOI).
- (iii) Preparing a detailed road map towards G-MACS, if agreed.
- (iv) Ensuring funding resources on a recurring basis.
- (v) Running an experimental PR project embracing different aspects for a short time.
- (vi) Review the efficacy, and formalize the scheme eventually.

The Working Group concluded that the strategy should take a mixed approach based on the conventional and the most modern concepts and systems of communication, with an essential feedback mechanism through a corrective loop. The priority would be an effective link between the highest information and the lowest user irrespective of the technology string involved.

All communication mechanisms of GOOS should be unified, at the same time their autonomy should be kept up, and they should be integrated with all other communication machineries of the related bodies (JCOMM, IOC, WMO, etc.). In due course, a full-fledged Public Relations outfit with constant linkage with capacity building and data and information management is envisaged.

The GOOS communication strategy transcends the confines of GOOS. The model could as well serve the interests of organizations such as IOC, WMO, JCOMM, etc., and its sister programmes like GCOS and GTOS.

The Committee complimented the Working Group on the progress made, and expressed its thanks to Laura Nowlin for providing her expert communications services free of charge.

The Committee agreed that the “Communications strategy” should not be confused with a “marketing strategy”, yet combining these two may prove advantageous, especially in financial terms. The strategy should capitalise on mobile cell phones, which offer a fast growing means of mass-communication. The agencies that “cell” their services would be good partners in GOOS communications. Communication is not one-way street, and the feedback loop contemplated in the communications strategy is very important. Considering the multiple tasks involved in developing the plans for GOOS communications, multiple foci should be worked out. GOOS may be able to profit from satellite data delivery systems to outreach its downstream users. As a first step it will be important for the Working Group to prioritise and cost the actions it proposes for the future. It will also be useful for the group to consider focussing initially on some flagship projects, like Argo, and to indicate what outputs are coming from them (it was noted that meteorological agencies could assist in providing that kind of information).

Action 40: The inter-sessional Communications Group should continue its work, aiming to finalise a draft communication plan (CP) by the end of May for endorsement by the GSC by e-mail. The Group should co-opt members from JCOMM (with the advice of Peter Dexter) and accept the offer of free assistance of communications specialist Laura Nowlin. In drafting the plan the objectives and means of achieving them should be discussed with POGO to see what part they may be able to play in it, and with LOICZ and IGBP to learn from their experiences in developing a communication outreach programme. Among other things, the draft plan should (i) prioritise the present set of short-term objectives; and (ii) consider the modalities for engaging organizations with money and interest (e.g. insurance or reinsurance companies). The plan should have an Appendix comprising a cost proposal for employing a communications professional to implement the strategy.

Action 41: So as to spread the word about GOOS, the Communications Working Group and the GOOS CB Panel should work with the IOI to consider how to capitalize on (i) IOI’s training programmes to develop appropriate training on GOOS for policy makers; (ii) IOI’s network of regional centres (25 globally); and IOI’s high level contacts at the ministerial level.

9. STRATEGIC REVIEW

9.1 REPORT OF THE GSC SESSIONAL WORKING GROUP ON STRATEGY (INCLUDING THE GOOS REVIEW)

Worth Nowlin reported on the deliberations of the GSC Sessional Working Group On Strategy (including The GOOS Review). The Working Group included F. Colijn, C. Crossland, N. Flemming, T. Malone, W. Nowlin (Chair), M. Sinclair, N. Swamy, and T. Yoshida. The

Working Group focused on the following key topics that would affect the future of GOOS on various time-scales (its work on The 2002 Review of GOOS is reported under agenda item 9.2).

(i) Preparation of GOOS Inputs to JCOMM-II (Canada, 2005)

An inter-sessional Working Group should be established to develop GOOS inputs to JCOMM-II. This material will be approved by the GSC via e-mail before the end of 2003, and transmitted to the JCOMM Secretariat for consideration by the JCOMM Management Committee at its third meeting in spring 2004. Inputs should include the following:

- Engaging (smaller) coastal States in the JCOMM process. The JCOMM-II agenda should include discussion of how the requirements of coastal nations can be included in the remit of JCOMM. Many such requirements are being assembled by GRAs. It should be clear therefore that requirements offered by a Federation of GRAs should be taken aboard by JCOMM. Discussions should include how global observations, products and services are of importance to coastal States.
- Inviting representatives of the established GRAs to JCOMM-II.
- Establishing and meeting satellite requirements. JCOMM-II should be briefed on the rolling review process of the IGOS Partners (e.g. in relation to the Ocean Theme), and as used in WMO, that is used to maintain requirements for oceanographic and atmospheric satellite sensors. The assistance of satellite-owning JCOMM States should be sought in discussing how to effect the difficult process of transition to operational status of the successful research satellite missions that meet these requirements.

In preparing GOOS inputs for JCOMM-II, it should be borne in mind that papers will have to be prepared earlier and in a more formal manner that is typical for the GSC or for I-GOOS meetings.

Action 42: Create inter-sessional Working Group to develop GOOS inputs to JCOMM-II, and follow recommendations given in GSC-VI 9.1.

(ii) Development of Additional Products and Services

The 2002 GOOS Review notes that GOOS is weak in the accessible products that are needed to meet its objectives, especially products based on non-physical observations. The JCOMM Services Coordination Group (SCG) is establishing a task team on Development of Ocean Services with the Terms of Reference given in [Annex V](#). It is recognized that this team would be able to recommend and implement part of the requirements of GOOS/OOPC, and perhaps of GOOS/COOP and the GRAs regarding product and service development. Therefore, it is recommended that the GSC welcome the opportunity to actively participate in this team, with membership modified as necessary. It is recommended that a representative of GODAE and of COOP be invited to join this team.

Action 43: GSC to actively participate in the JCOMM Services Coordination Group (SCG) Task Team on Development of Ocean Services, with membership modified as necessary to include a representative of GODAE and of COOP (Action required of GSC Chair, JCOMM Co-presidents, JCOMM and GOOS Secretariats, JCOMM Services Programme Area Coordinator).

(iii) Inter-sessional Activities for the GSC

An inter-sessional Working Group (or Groups) should be appointed to advance the planning and execution of improvements to the working practices of GOOS as part of the responsibility of the Committee. Some of these improvements are suggested in the 2002 GOOS Review.

(a) Communication Plan:

A proper Communication Plan for GOOS should be developed. As with all such plans it must include the (GOOS) goals to be met, target clients for information, messages for these client groups, the media to be used, schedules, and cost estimates. Consideration will be given to the suggestion of the 2002 GOOS Review Group that the GOOS 1998 be completely revised and re-issued on a regular basis. The Communications Plan Working Group will also consider the communications needs of JCOMM and therefore will include representation from JCOMM. Consideration will be given to the efforts by JCOMM and GOOS to re-design their web presence; every effort should be made to avoid duplication and maintain complementarities between the GOOS and JCOMM web presentations.

The Committee noted that this recommendation was taken care of by Actions 40 and 41.

(b) Strategic Plan:

Taking into account the recommendations of the 2002 GOOS Review that the GSC maintain a long-term strategic plan and a realistic work plan for continued development of the observing system, noting implied resources needs and that *The GOOS 1998* be updated, and

Noting the need to define the probable rate of development of different components of GOOS, and the time-scale for development of new services, products and benefits in a series of phases – short-term, medium-term, and long-term:

The Strategy Drafting Group of GSC-VI recommends:

- The Strategic Plan and Principles for the GOOS (GOOS Report 41), and The GOOS 1998 should be revised and updated by a Drafting Team of Experts appointed by GSC and the GOOS Board. The revision should describe the whole end-to-end system, including the Principles, the observing elements, data and information management, data assimilation and exchange, communications, quality control, modelling and product development, and delivery.
- The Drafting Team should be chaired by an editor, with the option to employ consultants and advisors, and/or call upon an appropriate level of support from the GPO.
- Funding should be sought from the GOOS sponsors and appropriate outside agencies and organizations.
- The revised strategy documents should be based on the work of the component bodies of GOOS and the associated specialist subgroups of GCOS, GTOS and JCOMM. Such bodies are requested to provide the maximum level of cooperation.
- The revised strategy documents should include analysis of the contribution to GOOS of the major international global science programmes such as WCRP, IGBP, GLOBEC, CLIVAR etc., and the contributions to GOOS from national programmes and activities of the GRAs.

- The time-scales for the phases of GOOS strategic development should be defined as short-term (2-4 years), medium-term (5-10 years) and long-term (11-25 years). The strategic documents should include a detailed work plan for the short-term phase, with resource needs, and an approximate estimate of resource needs for the medium term.
- Authorization for the revision should be achieved by mid-summer 2003, with a date of completion within 18-24 months. A pre-publication draft should be submitted for comment to GSC and the GOOS Board. The publication process of the revised strategy should combine all relevant technical means of electronic and hard copy production and distribution and access.
- The quality of the hard-copy printing and publication should be of similar standard to that of *The GOOS 1998*.

Action 44: To create an inter-sessional Working Group on Strategy, chaired by Worth Nowlin and comprising also Tom Malone, Ed Harrison, Nic Flemming, Tom Trull, Maria Paula Etala and the Director GPO, to develop version 2.0 of the Strategic Plan for GOOS, following the recommendations and timetable laid down in 9.1 (iii) 1-8, above;

Action 45: (i) To create an inter-sessional editorial group to update *The GOOS 1998*, chaired by Nic Flemming and comprising Helen Yap, Jose Muelbert, Silvana Vallergera, an OOPC representative, and the Director of the GPO, following the recommendations and timetable laid down in 9.1 (iii) 1-8, above; (ii) Peter Dexter to advise on the possible availability of a Canadian consultant.

The Committee noted that given that much of the text of *The GOOS 1998* could be re-used or modified only slightly, efforts should be made to keep the costs of the revision low. Nevertheless it was recognized that because the graphics artist who produced *The GOOS 1998* had not kept the high-resolution original versions of the artwork, some would have to be redone.

The Committee noted that an executive summary of the finalized documents could be used in due course as a leaflet highlighting achievements.

(iv) Review/Revision of the Ocean Theme

The first review of the Ocean Theme document setting out ocean satellite requirements will occur in 2003. The GPO will obtain from the Ocean Theme Team leader, Eric Lindstrom, plans for this review and disseminate them to the chairs of OOPC and COOP. Those panels will review and revise ocean satellite requirements during their 2003 meetings, and, after coordination, communicate this information to the Ocean Theme Team leader.

Care should be taken to ensure that the revised Ocean Theme satellite requirements are also entered into the WMO Global Observing System database.

The Committee noted that this topic was addressed by action 25.

9.2 REFINING THE GOOS STRUCTURE

Worth Nowlin reported on the views of the Working Group on Strategy on the recommendations of the 2002 Review of GOOS (working document GSC-VI/11).

First the Review Group should be complemented for their comprehensive and thoughtful review. Their advice will prove of considerable value to the evolution of the GOOS structure, organizational functions, and methods of operation.

I-GOOS — A clear overarching problem for the Review Group was the rationale for I-GOOS as a body separate from the IOC Assembly, and the need for improving the effectiveness of both of those bodies in support of GOOS development. It was to be hoped that the IOC Assembly would work to improve the effectiveness of the intergovernmental management of GOOS.

The GSC should strongly endorse the need, stated in the draft 2002 Review of GOOS, to make I-GOOS a more effective and useful body for intergovernmental coordination, by ensuring that the delegate or delegates attending are able directly or through consultation to represent both the full national responsibility for implementation of GOOS and for the use of GOOS products. Further, the GSC should recommend to the Review Group that the IOC Member States should recognize these responsibilities in regard to the IOC Assembly as well.

GOOS Regional Alliances — The working group considered that the Review neither gives adequate attention to GRAs, nor recognizes adequately their roles in the development of GOOS. To assist the Review Group in the proper consideration of the GRAs and the role of a possible Federation of GRAs in the development of GOOS, the working group offered the following information and associated recommendations:

Achieving the goals of GOOS requires the development of a global system for both coasts and oceans based on internationally accepted policies and the establishment of common standards and protocols for measurements, data management and communications, and data products. As articulated in the Integrated Strategic Design of the Coastal Module of GOOS, GRAs provide the most effective means to design and implement pilot projects and to develop and distribute products that are locally relevant. GRAs are needed to:

- (i) establish national and regional priorities for data and data-products;
- (ii) participate in the design and implementation of pilot projects that are related to these priorities;
- (iii) guide and manage the establishment of regional ocean observing systems based on these priorities;
- (iv) coordinate the development of a global network of observations, data management and analysis that serves the needs of all or most GRAs; and
- (v) improve the observing system as new technologies and knowledge become available and user needs are specified and evolve.

In short, the implementation, operation and improvement of GOOS are critically dependent on the coordinated development of GRAs that contribute to and benefit from the global system. Thus the GSC should recommend the development of GRAs, to include all coastal states, and of the GOOS Regional Forum to oversee the coordinated development of a global network, including capacity building and product development, that meets the collective and specific requirements specified by GRAs.

GRAs should be formed through agreement among participating countries, national organizations and international bodies (e.g. Regional Seas Conventions, Regional Fisheries bodies, Large Marine Ecosystem programmes, Marine Protected Areas, Coalitions of marine-oceanographic laboratories). Members should represent bodies that use, depend on, or are

responsible for the marine environment and natural resources in the region, including those with statutory legal duties to protect and manage the marine environment, resources, and public health and safety. To be recognized as a GRA, the alliance must conform to GOOS Principles, Policies, and Practices that are established and endorsed by the IOC, WMO, and UNEP.

Private Sector Involvement in GOOS — The Working Group considered that the Review Group's view of private sector involvement in GOOS, as stated in the 2002 GOOS Review, is too narrow in that the draft report states that industry is not likely to be a significant funder of GOOS. While this may be true, it seems quite likely that the private sector will contribute to (and benefit from) GOOS in other ways, including:

- (i) provision of needed technology;
- (ii) production and sale of value-added products based at least in part on GOOS observations;
- (iii) advocacy for the system; and
- (iv) participation in partnerships for data exchange.

Member States' Support of GOOS — The GSC should strongly endorse the recommendations that IOC Member States provide priority support and additional resources to ensure operational effectiveness of GOOS and related structures such as JCOMM. This would be in keeping with the flagship status of GOOS in the IOC.

Capacity Building — The GSC should recommend that the GOOS Capacity Building Panel should continue to report via the GSC rather than be transferred or reformed as a body reporting directly (and only) to I-GOOS (as suggested by section the draft Review Report). The GSC should consider it premature to consider re-assignment or reconstitution of the GOOS CB Panel. This Panel is in a formative stage requiring close cooperation with the GSC coastal and open ocean panels as well as with the regional IOC GOOS Offices in Perth and Rio. The intersection of these activities lies with the GSC. Moreover, close cooperation of the GOOS CB Panel with the Capacity Building Coordination group of JCOMM is expected to lead to eventual merger of these bodies. Finally, more broadly based capacity building activities may be incorporated by liaison with the CB activities of related organizations, of which there are many.

Oversight of Modelling and Data Assimilation — The need for the GSC to maintain oversight of modelling and data assimilation, and to provide a strategy for GOOS is accepted as a valuable suggestion. However, the suggested formation of a GSC Modelling Panel seems premature. Liaison on modelling and data assimilation should begin between the OOPC and COOP and the appropriate committees within the WCRP, and the IGBP, and the GRAs, and progress in this topic area should be reviewed regularly by the GSC.

Resourcing the GOOS and JCOMM Secretariats — The Review report should convey to Member States the need for additional resources in cash and people to enable the GOOS and JCOMM Secretariats to cope adequately with the growth in GOOS and JCOMM developments. This support should include resources for personnel to provide enhanced support for capacity building.

Identifying User Needs — As indicated in the 2002 GOOS Review, identifying and meeting Users' Needs is a key to the success of the system. To a considerable extent this task is being done by the COOP and the OOPC as they develop design and implementation plans. It is noted that on behalf of (and with the help of) GOOS/OOPC, GCOS is already collecting and analysing User Needs from the parties to the UN Framework Convention on Climate Change. However, there

remains a pressing need to systematically assess User Needs at the national level. Key needs are for ocean information to support national and international policy and treaty commitments now and in the future, including the needs of UN Conventions. Assessing these needs in detail will require considerable analytical effort, as well as time and effort in communicating with Member States to establish commitments from Users. This work will have to be carried out by the GOOS Secretariat. Recognizing that this is yet another task for an already stretched Secretariat, the need is seen for resources with which to hire consultants to undertake the task (as has been done in collating data on national commitments).

Suggested Terms of Reference for the GSC — The 2002 GOOS Review suggested 4 Terms of Reference for the GSC. The first of these has six sub-terms. Sub-term (e) should be revised to read:

The development of plans for the migration of research and technology into operational status through a recognized process (from R & D to pilot project to pre-operational to operational status).

Without re-writing, this sub-term would limit oversight to exclude operational satellites and implementation of GRAs.

ToR (ii) should read *GOOS Board*, not *I-GOOS Board*.

The recommended ToR (iii) does not correspond to the GSC recommendation (above) regarding the organization of capacity building within GOOS. This ToR might be re-written thus:

To undertake, in conjunction with I-GOOS, JCOMM and related programmes, capacity building activities aimed at further GOOS development and use of system data and products.

The Committee thanked the Working Group for its comprehensive analysis of the 2002 Review of GOOS, accepted its recommendations, and recommended the following action:

Action 46: Noting that the GSC accepted the recommendations of the sessional Working Group on Structure regarding the 2002 Review of GOOS, the GPO was asked to convey these recommendations (GSC-VI section 9.2) to the GOOS Review Group before 7 March 2003, for consideration in the amendments to the report of the Review Group for the IOC Assembly.

The Committee noted in discussion that the Regional GOOS Forum is building towards the creation of a strong network of GRAs.

The Committee noted the potential for industry to compete to provide some of the services within the system, and even to operate parts of it. Several members noted that due to the weakness or lack of effective infrastructure in some developing regions we may have to rely on the private sector as well as the public sector for running parts of GOOS.

The Committee agreed with the emphasis of the Review Group on the importance of services and products and decided on the following action:

Action 47: Make GOOS products and services a focus for GSC-VII in Paris in spring 2003, and arrange a comprehensive (say half day) demonstration of GOOS products and services to take place during that meeting, along with a presentation from Jean-François Minster, and followed by a reception particularly for French GOOS suppliers and users (inter-sessional organizing group to comprise Raph Rayner (Chair), GPO Director, Worth Nowlin, JCOMM Task Team on Products and Services, Peter Dexter, Johannes Guddal, and French GOOS advisor).

10. COMMITTEE BUSINESS - B

10.1 MEMBERSHIP OF GSC AND ITS ADVISORY PANELS

Colin Summerhayes reported briefly on the procedure required to facilitate the rotation of Members on and off the Committee, and drew attention to the recent past membership of the Committee (working document GSC-VI/20). He noted that Prof. Nowlin had now come to the end of a six-year term and would be rotating off the Committee. Given the initial three-year appointment of members to the 12-person core committee, he noted that three other members were also eligible for rotation off the Committee.

The Committee decided that because it was important for new members to develop a sense of continuity, and that with the several rotations off the committee in recent years there was now a danger of losing some of the desired continuity, none of the three eligible members would be retired at this time.

Action 48: (i) Members to suggest to GSC Chair and GPO, by end March, names of potential replacements for Worth Nowlin in the area of ocean physics and climate; (ii) GPO to advise GSC Chair on names of eligible candidates still in reserve from the nominations exercise of 2002.

The Committee thanked Worth Nowlin warmly for his six years of service to the GSC, and welcomed his keenness to continue as the GSC Chair's alternate for meetings of COOP and the JCOMM Management Committee.

10.2 REVIEW AND AGREEMENT ON ACTION ITEMS

Colin Summerhayes reviewed progress against the action items from GSC-V (working document GSC-VI/6). He noted that the bulk of the items had been completed. Still outstanding were the following:

Action 49: (old Action item GSC-V.11): Members to list significant highlights of GOOS (ways in which GOOS had made a significant impact on the scientific and other user communities) from the past 5 years, for the GPO to put on the GOOS website. Feedback needed by end May.

Action 50: (based on old Action item GSC-V.12): Indicate to GRAs that the software developed by COOP to determine the core variables to be measured for coastal seas is available from <http://www.phys.ocean.dal.ca/~lukeman/COOP/>.

Action 51: (based on old Action item GSC-V.27): (i) Tony Knap will prepare a PowerPoint presentation on the RAMP pilot project to be used by GRAs and others; (ii) Tom Malone will present the talk at I-GOOS-VI.

Action 52: (based on old Action GSC-V.49): (i) GSC Chair to ask Jesse Ausubel to give a presentation at GSC-VII on the requirements of the Census of Marine Life for ocean monitoring; (ii) Tony Knap to provide advice on what other high level foundation people might be invited to GSC-VII.

The Committee reviewed and finalized the list of actions for GSC-VI (agenda item 12).

Action 53: GPO to finalize and circulate the first draft of the report of the meeting by March 7.

Action 54: (i) Tom Malone to represent GSC Chair at I-GOOS-VI; (ii) GPO to finalize executive summary of report of GSC-VI for Tom Malone by March 7.

10.3 DATE AND VENUE OF GSC-VII

Following the plan that the GSC should alternate its meetings between the regions and UNESCO HQ (Paris), GSC-VII will be held in France in spring 2004 (date to be determined; venue to be outside UNESCO—e.g. at IFREMER).

Action 55: GPO and GSC Chair to approach Jean-François Minster with a view to holding GSC-VII and the associated demonstration of products and services on IFREMER premises during the last week in April (later agreed as Brest, 26–30 April 2004).

The Committee was asked to suggest suitable venues for GSC-VIII (spring 2005). Offers came from the USA and India. Locating the meeting in one of the cities graced by a regional IOC GOOS Office (Perth or Rio) was also suggested.

Action 56: GPO and GSC Chair to decide on the venue for GSC-VIII.

11. CLOSURE

The meeting ended at 4.00 pm on Friday 28 February 2003. The Chairman thanked the hosts, the University of Cape Town for their hospitality and their services, which had enabled the meeting to progress exceptionally smoothly. He thanked the members for attending, especially the new members of the core committee. And he thanked Paul Mason and the Review Group for an excellent analysis of all the key issues.

12. LIST OF ACTIONS

Action	1	GPO to put all documents on the website in .rtf format, where possible, to make them readily accessible to all.
Action	2	(i) GSC Chair to draft a letter to go to appropriate agencies to stress the importance of Jason-2 for the success of GOOS; (ii) Similar letters to be drafted and sent by OOPC, by COOP, by Ralph Rayner (from the UK Marine Information Council), and by Tony Knap (operating through POGO).
Action	3	I-GOOS to consider asking Member States to report on what they are doing to assess the state of their ocean ecosystems.
Action	4	The GSC requests the Executive Secretary of the IOC to give a high priority to working with Member States to ensure that the GPO is resourced with personnel at a level adequate to the tasks required of it by Member States through I-GOOS and JCOMM, so as to meet the requirements of the GSC, I-GOOS and JCOMM, noting that given the existence of the Internet new staff do not have to work in Paris but could work part-time or full-time for GOOS in their own home offices.
Action	5	Members to provide or suggest key articles to launch new issues of the GOOS Products and Services Bulletin.

Action	6	The Review Group would need to take into consideration the recent recommendation by the JCOMM Management Committee, and its acceptance by GSC-VI (see below) that the GOOS and JCOMM CB Panels should be combined.
Action	7	The GSC requests the Executive Secretary of the IOC to make available to the GOOS CB programme at least 50% of the time of the new IOC P5 grade post in Capacity Building when the new recruit arrives in post later this year.
Action	8	GSC Chair to work with POGO to help to get more resources into POGO, and to help to broaden POGO membership.
Action	9	Tom Malone to work with COOP to write a COOP letter in support of Jason-2, and to make appropriate recommendations to the US Oceans Commission and other appropriate national bodies on the need for HF radar.
Action	10	GSC to encourage through I-GOOS-VI and the GRAs the development of pilot projects at the regional level to demonstrate the usefulness of the ecosystem-based approach to fisheries and environmental management, with a view to a report on progress at GSC-VII.
Action	11	The GSC asked I-GOOS to consider how it might encourage the development of the concept of a Federation of GRAs, using the Regional GOOS Forum as a starting point.
Action	12	GSC requests through I-GOOS-VI to the IOC Assembly that Member States take the actions, described below, to implement fully the initial global ocean climate observing system agreed at and subsequent to the OceanObs99 conference, namely: (i) To follow the recommendations and take action to increase the number of surface drifting buoys to 1,250, of repeat SOOP XBT lines to 41, of geocentrally located tide gauges to 86, of ocean reference time series stations to 29, of Argo profiling floats to 3,000, of VOSclim ships to at least 200, of tropical surface moorings to 119 and to carrying out the agreed repeat hydrography and carbon content and surface carbon flux survey projects, which are the key in situ observing elements of the agreed initial global ocean climate observing system. (ii) To participate fully in ocean data archaeology efforts, in free and open exchange of contemporary data, and in support of the development and use of modern data communication, access and serving technology, which comprise the data system component of the agreed initial global ocean climate observing system. (iii) To support the Global Ocean Data Assimilation Experiment and other ocean climate analysis activities, which comprise the ocean climate product component of the agreed initial global ocean climate observing system. (iv) To implement the agreed ocean reference sites within the framework of the GEO project, recognizing that they are a key link between the initial global ocean climate observing system and the development of sustained observing in support of the biogeochemical and ecosystem communities.

Action	13	Through the CEOS representative to the GSC, GSC requests the agencies involved in CEOS and IGOS-P to take steps to provide for the continuation of climate quality ocean surface altimetry, ocean colour and surface vector wind missions, which are the key satellite components of the agreed initial global ocean climate observing system.
Action	14	GSC requests the OOPC to undertake the following actions: (i) Foster development of an ongoing observing system evaluation and evolution activity, in recognition that much will be learned, as the initial global ocean climate observing system provides more complete information than has been available previously, and that specific observing system activities should be adjusted in reaction to new knowledge and to new technology. (ii) To develop recommendations for an activity to ensure that operational flux fields will be stored and made available for comparison with each other and with high quality <i>in situ</i> observations. (iii) To carry out a review of the global surface drifting buoy programme and formulate recommendations to maximize the utility of this programme. (iv) To expedite its efforts to develop a set of ocean climate indicators with associated observing system activity needs. (v) To work with WCRP to review the state of climate-related sea ice analysis capability, with appropriate specialist groups, and recommend any needed actions for improvement. (vi) To review the trends in subsystem development with a view to developing a 10-year development profile for each as the basis for identifying priorities for investment.
Action	15	GSC requests the OOPC and COOP to formulate a joint pilot project to make use of GODAE products and shared technology.
Action	16	GSC requests JCOMM Management committee to take actions to identify the reasons why many <i>in situ</i> data are not being sent to the relevant international archives, and to take action wherever possible to use the resources of the larger <i>in situ</i> community to assist the nations in bringing their data to the archives. As an immediate action it is requested that this be brought to the attention of the GLOSS group of experts.
Action	17	Members to provide Paul Mason before March 7 with any suggestions they have to improve the presentation of the ocean component of the Adequacy Report.
Action	18	GSC requested OOPC to work with the JCOMM Observations Coordination Group (OCG) to develop a mechanism for coordinating observational data requirements with implementation mechanisms.
Action	19	GSC accepted the invitation to co-sponsor the JCOMM <i>ad hoc</i> Task Team on the Development of New Products and Services, and called for membership nominations from COOP and GODAE.

Action	20	GSC agreed with the proposal from the JCOMM Management Committee to work towards the merger of the JCOMM CBCG and GOOS CB Panel; action to draw up a merger plan to be taken by JCOMM CB Coordinator and GOOS Panel chair, for MAN-3 and GSC-7.
Action	21	GSC to request JCOMM to invite the JCOMM TT on resources to support GOOS also.
Action	22	GSC agreed to the request from JCOMM to participate in the work of GOOS to develop a communications strategy, which could then also be used as the basis of a related JCOMM communications strategy, and requested JCOMM to nominate one or more members to the communications working group.
Action	23	GSC agreed to cosponsor the Ocean Products Workshop, May 2004 (no financial implications), and requested OOPC and the GOOS Regional Forum to provide representatives on the organizing committee.
Action	24	GSC requests IGOS Partners, through the CEOS representative to the GSC, to ensure adequate linkage between the requirements for remote sensing identified by the Oceans and Coastal Theme Panels.
Action	25	GPO and Eric Lindstrom to work with OOPC, COOP, JCOMM and the GRAs to carry out the rolling review of Ocean Theme by year end 2003.
Action	26	OOPC to work with International Time Series Science Team and JCOMM to develop a data and information plan.
Action	27	GSC Members to send to the GPO suggestions for the names of possible chairs for the GOSIC review by end April.
Action	28	GPO to arrange the second review of GOSIC during 2003, in concert with GCOS and GTOS.
Action	29	(i) The Working Group on Indicators to continue its work to finalize the present draft and present it to GSC-VII; (ii) GSC to establish collaboration with UNEP's DEWA to discuss development of indicators for coastal and marine assessments, under the framework of UNEP's GEO-4 process and reporting; (iii) GPO and GSC Members to work together to develop a page of indicators that can be placed on the GOOS website; (iv) Franciscus Colijn to provide Members and the GPO with copies of the recent Dutch study on marine indicators.
Action (old Action GSC-V.31)	30	GPO will work closely with the ICES-IOC Steering Group on GOOS (at its next meeting in Nantes, April 2003) to see how ICES can help take forward COOP and OOPC initiatives and vice versa, as a prelude to consideration of the development of an Atlantic-wide multi-community approach to GOOS that would build on and complement ongoing developments involving GODAE, EuroGOOS, and US and Canadian agencies. One possible outcome may be arranging a meeting of all the different North Atlantic operational, modelling and research groups to aim at the development of a comprehensive and integrated observing system for the region.

Action (old Action GSC-V.32)	31	Tom Malone will identify a COOP representative to explore with PICES the possibility of developing a joint GOOS and PICES approach to ocean observations in the North Pacific, including the possibility of establishing a regional GOOS office for the North Pacific.
Action	32	(i) The trends noted by Bert Thompson's review of national inputs need to be cross checked by the JCOMMOPS Centre; (ii) JCOMMOPS should be providing regular statistics to JCOMM and GOOS on system performance.
Action	33	GSC requests JCOMMOPS to develop a method for demonstrating the volume flow of data over time.
Action	34	Silvana Vallergera, GPO and Bert Thompson to develop a proposal for consideration at the I-GOOS-VI meeting in March 2003 for a mechanism for compiling and analysing all national contributions to GOOS, based on national surveys in process in the Mediterranean, including the data collected by GRAs, so as to be able to provide comprehensive reports on the status of the observing system.
Action	35	(i) The GPO should review more cost effective way of covering the growing number of GOOS related meetings; (ii) The GPO should investigate secondment possibilities and broader base of external funding; (iii) A forecast of future secured funds should be presented to each GSC meeting; and (iv) The GSC should make strong representation to IOC on the need for continuity in the role of the head of the GPO.
Action	36	The GSC formed a small inter-session group to comprise Ralph Rayner (Chair), Tony Knap, the Director GPO and other members as appropriate, to draft a Development Plan and to report back to GSC-VII.
Action	37	Merge the GOOS and JCOMM CB Panels, following the requirements and strategy noted in section 8.2, above.
Action	38	New IOC Capacity Building person to create registers of existing capacity building efforts (including those of related programmes – organized in the context of GRAs) and of potential sources of funds for capacity building.
Action	39	The Chair of the GOOS CB Panel or his representative should report on progress and plans to I-GOOS and be part of the Regional GOOS Forum.

Action	40	The inter-sessional Communications Group should continue its work, aiming to finalize a draft communication plan (CP) by the end of May for endorsement by the GSC by e-mail. The Group should co-opt members from JCOMM (with the advice of Peter Dexter) and accept the offer of free assistance of communications specialist Laura Nowlin. In drafting the plan the objectives and means of achieving them should be discussed with POGO to see what part they may be able to play in it, and with LOICZ and IGBP to learn from their experiences in developing a communications outreach programme. Among other things, the draft plan should (i) prioritise the present set of short term objectives; and (ii) consider the modalities for engaging organizations with money and interest (e.g. insurance or reinsurance companies). The plan should have an Appendix comprising a cost proposal for employing a communications professional to implement the strategy.
Action	41	So as to spread the word about GOOS, the Communications Working Group and the GOOS CB Panel should work with the IOI to consider how to capitalize on: (i) IOI's training programmes to develop appropriate training on GOOS for policy makers; (ii) IOI's network of regional centres (25 globally); and IOI's high level contacts at the ministerial level.
Action	42	Create inter-sessional Working Group to develop GOOS inputs to JCOMM-II, and follow recommendations given in GSC-VI 9.1.
Action	43	GSC to actively participate in the JCOMM Services Coordination Group (SCG) Task Team on Development of Ocean Services, with membership modified as necessary to include a representative of GODAE and of COOP (Action required of GSC Chair, JCOMM Co-presidents, JCOMM and GOOS Secretariats, JCOMM Services Programme Area Coordinator).
Action	44	To create an inter-sessional Working Group on Strategy, chaired by Worth Nowlin and comprising also Tom Malone, Ed Harrison, Nic Flemming, Tom Trull, Maria Paula Etala and the Director GPO, to develop version 2.0 of the Strategic Plan for GOOS, following the recommendations and timetable laid down in 9.1 (iii) 1-8, above.
Action	45	(i) To create an inter-sessional Editorial Group to Update <i>The GOOS 1998</i> , chaired by Nic Flemming and comprising Helen Yap, Jose Muelbert, Silvana Vallergera, an OOPC representative, and the Director of the GPO, following the recommendations and timetable laid down in 9.1 (iii) 1-8, above; (ii) Peter Dexter to advise on the possible availability of a Canadian consultant.
Action	46	Noting that the GSC accepted the recommendations of the sessional Working Group on Structure regarding the 2002 Review of GOOS, the GPO was asked to convey these recommendations (GSC-VI section 9.2) to the GOOS Review Group before March 7, for consideration in the amendments to the report of the Review Group for the IOC Assembly.

Action	47	Make GOOS products and services a focus for GSC-VII in Paris in spring 2003, and arrange a comprehensive (say half day) demonstration of GOOS products and services to take place during that meeting, along with a presentation from Jean-François Minster, and followed by a reception particularly for French GOOS suppliers and users (inter-sessional organizing group to comprise Raph Rayner (Chair), GPO Director, Worth Nowlin, JCOMM Task Team on Products and Services, Peter Dexter, Johannes Guddal, and French GOOS advisor).
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Action	55	GPO and GSC Chair to approach Jean-François Minster with a view to holding GSC-VII and the associated demonstration of products and services on IFREMER premises during the last week in April (later agreed as Brest, 26-30 April 2004).
Action	56	GPO and GSC Chair to decide on the venue for GSC-VIII.

ANNEX I

AGENDA

1. OPENING AND WELCOME

- 1.1 WELCOME, INTRODUCTIONS, SPONSOR ORGANIZATION'S COMMENTS
- 1.2 LOGISTICS
- 1.3 FORMATION OF SESSIONAL WORKING GROUPS DEALING WITH STRATEGIC PLANNING, CAPACITY BUILDING, AND WORK PROGRAMME AND BUDGET

2. OVERVIEWS OF GOOS DEVELOPMENTS

- 2.1 STRATEGIC OVERVIEW
- 2.2 THE INTERGOVERNMENTAL PERSPECTIVE
- 2.3 REPORT AND PERSPECTIVE OF THE GOOS PROJECT OFFICE
- 2.4 CHARGE TO SESSIONAL WORKING GROUP ON WORK PROGRAMME AND BUDGET

3. THE GOOS REVIEW

- 3.1 THE EXTERNAL REVIEW OF GOOS
- 3.2 OPEN DISCUSSION OF ISSUES
- 3.3 CHARGE TO SESSIONAL WORKING GROUP ON STRATEGIC PLANNING

4. GOOS CAPACITY BUILDING

- 4.1 GOOS CAPACITY BUILDING PANEL AND RELATION TO JCOMM
- 4.2 RELATED ACTIVITIES (POGO, IOCCG, etc)
- 4.3 CHARGE TO SESSIONAL WORKING GROUP ON CAPACITY BUILDING

5. STATUS OF GOOS DESIGN PLANS AND PILOT PROJECTS

- 5.1 COASTAL OCEAN OBSERVATIONS
- 5.2 OPEN OCEAN OBSERVATIONS

6. IMPLEMENTATION OF GLOBAL GOOS DESIGNS

- 6.1 *IN SITU* OBSERVATIONS
- 6.2 THE OCEAN THEME – ROLLING REVIEW PROCESS FOR SATELLITE REQUIREMENTS
- 6.3 DATA AND INFORMATION MANAGEMENT
- 6.4 INDICATORS

7. REGIONAL/NATIONAL GOOS DEVELOPMENTS

- 7.1 REGIONAL GOOS ALLIANCES – REPORT ON FIRST REGIONAL GOOS FORUM
- 7.2 COORDINATION WITH OTHER REGIONAL ACTIVITIES (UNEP, FAO, LME)
- 7.3 IOC-GOOS REGIONAL OFFICES
- 7.4 NATIONAL GOOS DEVELOPMENTS
- 7.5 QUESTIONS AND DISCUSSION

8. COMMITTEE BUSINESS - A

- 8.1 REPORT OF SESSIONAL WORKING GROUP ON PROGRAMME AND BUDGET, AND APPROVAL OF WORK PROGRAMME AND BUDGET
- 8.2 REPORT OF SESSIONAL WORKING GROUP ON CAPACITY BUILDING, AND AGREEMENT ON ACTIONS REQUIRED IN CAPACITY BUILDING
- 8.3 SUGGESTIONS FOR OUTREACH AND COMMUNICATIONS

9. STRATEGIC REVIEW

- 9.1 REPORT OF SESSIONAL WORKING GROUP ON STRATEGIC PLANNING
- 9.2 FORMALIZING THE GOOS STRATEGY; APPOINTMENT OF AN INTERSESSIONAL WORKING GROUP
- 9.3 REFINING THE GOOS STRUCTURE

10. COMMITTEE BUSINESS - B

- 10.1 MEMBERSHIP OF GSC AND ITS ADVISORY PANELS
- 10.2 REVIEW AND AGREEMENT ON ACTION ITEMS
- 10.3 DATE AND VENUE OF GSC-VII

ANNEX II

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ANNEX III

LIST OF DOCUMENTS*

Document Code	Title	Agenda Items	Lang.
WORKING DOCUMENTS			
GSC-VI/1	Provisional Agenda	1.2	E only
GSC-VI/1B	Annotated Provisional Agenda	1.2	E only
GSC-VI/2	Provisional Timetable	1.2	E only
GSC-VI/3	List of Participants	1.2	E only
GSC-VI/4	Provisional list of Documents (this document)	1.2	E only
GSC-VI/5	Report of GSC-V	2.1	E only
GSC-VI/6	Progress against the actions of GSC-V	2.1	E only
GSC-VI/7	Report of the Session (to be prepared during the meeting)	All	E only
GSC-VI/8	An I-GOOS Perspective on the Future of GOOS	2.2	E only
GSC-VI/9	GPO Director's Report	2.3	E only
GSC-VI/10	GOOS Project Office Work Programme and Budget for 2003 (vs outcomes)	2.4	E only
GSC-VI/11	Report of the GOOS Review Panel	3.1&3.2	E only
GSC-VI/12	GOOS Strategic Plan Version 1.0	3.3	E only
GSC-VI/13	Action Plan of GOOS Capacity Building Panel	4.0	E only
GSC-VI/14	Report of COOP activities and plans	5.1	E only
GSC-VI/15	Report of OOPC activities and plans	5.2	E only
GSC-VI/16	Rolling Review Plan for Ocean Theme	6.2	E only
GSC-VI/17	Report on GOSIC	6.3	E only
GSC-VI/18	Report on Inter-sessional Working Group on Indicators	6.4	E only
GSC-VI/19	Report on Inter-sessional Working Group on Communication	8.3	E only
GSC-VI/20	Report on Recent Past Membership of Core Group of GSC	10.1	E only
GSC-VI/21	List of actions of GSC-V (to be prepared during the meeting)	10.2	E only
BACKGROUND DOCUMENTS			
GSC-VI/B1	Report of Global Observing Requirements of WSSD	2.0	E only
GSC-VI/B2	Report of I-GOOS-V (June 2001)	2.2	E only
GSC-VI/B3	Report of the First Session of the GOOS Capacity Building Panel	4.0	E only
GSC-VI/B4	Report of the First Session of the JCOMM Capacity Building Panel	4.1	E only
GSC-VI/B5	Report of the Outcomes and Plans of the GCOS Capacity Building Programme	4.0	E only
GSC-VI/B6	Report on POGO Fellowship Programme	4.2	E only
GSC-VI/B7	Report on IOCCG Capacity Building Programme	4.2	E only
GSC-VI/B8	Report on IODE Capacity Building Programme	4.2	E only
GSC-VI/B9	Report on CEOS Capacity Building Programme	4.2	E only
GSC-VI/B10	Final COOP design plan	5.1	E only
GSC-VI/B11	GODAE Implementation Plan	5.2	E only
GSC-VI/B12	GCOS Adequacy Report	5.2	E only
GSC-VI/B13	JCOMM Progress Report	6.1	E only
GSC-VI/B14	Report of the 9 th IGOS Partners Meeting (Jun 2002)	6.2	E only
GSC-VI/B15	The latest IGOS Brochure	6.2	E only
GSC-VI/B16	The IGOS Type II WSSD Partnership	6.2	E only
GSC-VI/B17	The JCOMM Data and Information Management Group	6.3	E only
GSC-VI/B18	Report on Oceans Information Technology Pilot Project	6.3	E only
GSC-VI/B19	Report of First Regional GOOS Forum (December 2002)	7.0	E only
GSC-VI/B20	Report on Progress with and Plans for GOOS connections to ICES/PICES	7.1&7.2	E only
GSC-VI/B21	Report on Progress with and Plans for Perth Office	7.3	E only
GSC-VI/B22	Report on Progress with and Plans for Rio Office	7.3	E only
GSC-VI/B23	Report on Status of National GOOS Commitments	7.4	E only

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

ANNEX IV

GOOS CAPACITY BUILDING ACTION PLAN

Phase I, Lifecycle 2002-2004

Reference Documents

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

CONTEXT

Mission Statement:

“To develop the capacity building needed to ensure the growth, development, sustenance and evolution of GOOS worldwide”.

Long-term objective:

“Build a solid foundation for global operational oceanography to ensure the complete development of GOOS by 2008-2010”.

This requires:

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

In order to:

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

We already have:

- Statement of Principles (GOOS Report No. 69);
- Implementation Strategy (GOOS Report No. 106);
- Capacity Building Panel;
- Shared responsibility with the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) Capacity Building Programme Area Coordination Group (CBCG);
- Existing capacity building activities (e.g., International Ocean Data Exchange (IODE), UNESCO Bilko project);
- Existing Partnerships (e.g., POGO, IGOS Partners);

- GOOS Project Office staff in Paris, Bangkok, Perth, Rio and Cartagena with part time responsibilities for CB;
- Regional GOOS Alliance Secretariats with similar part time responsibilities (e.g. MedGOOS);
- Approximately \$250,000 annually in programme costs in support of GOOS-CB.

THE ACTION PLAN

The Action Plan details the short to medium term objectives, the actions and the timeframes required to realize selected high-priority objectives. We see Regional GOOS Alliances as essential for implementation. Therefore it is suggested that the Action Plan is used as a template by national and regional GOOS bodies and GOOS technical panels. We also see Partnerships being critical to meeting the objectives. The Action Plan builds on existing initiatives and is expected to evolve as targets and priorities change; for this reason this Action Plan is considered to represent phase I of the GOOS capacity building programme.

GOOS Capacity Building Actions and Activities

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

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

The following are seen as key horizontal crosscutting activities:

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

Conceptual framework

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

Capacity building is needed to improve performance at all three levels, and to enable developing countries in particular to participate in, benefit from, and contribute to GOOS.

Specific Actions Required to Implement Phase I

1. Create and sustain a capacity building staff position within the IOC to coordinate capacity building activities.
2. Create an information system to avoid duplication of capacity building initiatives of relevance to GOOS (e.g., calendar of activities).
3. Improve the data and information management networks and exchange in support of GOOS by strengthening collaboration with IODE's Ocean Data Information Network (ODIN) and OceanTeacher to make effective use of the experience gained and groundwork done by IODE.
4. Develop a web portal (gateway to internet based information sources) to provide a comprehensive information resource of ocean activities relevant to GOOS, making use of IODE's dynamic content management system and Ocean Portal.
5. Create a set of "Start up packs" following the example provided by the IODE Resource Kit and focusing on operational oceanography.
6. In consultation with JCOMM, WMO and CEOS, develop a plan to guide capacity building in remote sensing.
7. Improve knowledge of, and training in the use of, oceanographic remote sensing in support of the development of GOOS data products and services, by capitalizing on the UNESCO Bilko project (e.g., to create introductory and regional distance learning modules).
8. In consultation with JCOMM, improve knowledge and training in the use of oceanographic *in situ* methods and data in support of the development of GOOS data products and services, for instance by creating appropriate distance learning modules (e.g., using netCDF and ncview).
9. In consultation with JCOMM and WMO, develop a plan for CB in ocean modelling and forecasting including the development of a pool of freely available numerical models.
10. In cooperation with JCOMM and other partners, explore the possibility of an infrastructure-sharing programme to facilitate the exchange of technology, equipment and services between countries [e.g., a Voluntary Cooperation Program (VCP)].
11. Providing alternative mechanisms to the Internet for access to all GOOS materials (e.g., CD's).
12. In association with IOI, assemble educational material to explain the benefits and applications of global observations to students. This would use, for example, games-based learning packages (targeted at schoolchildren) and Argo profile data as in the SEREAD project for high-school students.
13. Provide information about educational materials and initiatives currently available from national and international agencies (Met Offices, Space agencies, Navies etc.) for graduate and postgraduate students, and technical staff.

14. In cooperation with I-GOOS and the JCOMM Task Team on Resources, acquire the necessary resources to implement Phase I.

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

GOOS Capacity Building Program Evaluation

The programme will be evaluated as follows:

- (i) Proposal evaluation: see Implementation Plan, Annex IV, GOOS Report No. 106.
- (ii) Project evaluation on completion
(see CB Principles pages 7 and 8, GOOS Report No. 69).
- (iii) Programme evaluation and review
(see CB Principles pages 7 and 8, GOOS Report No. 69).

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

ANNEX V

TERMS OF REFERENCE OF JCOMM SERVICES COORDINATION GROUP TASK TEAM ON DEVELOPMENT OF OCEAN SERVICES

Introduction

1. The first Session of the JCOMM Management Committee (MAN-I) endorsed the establishment of a task team on the Development of Ocean Services in order to more rapidly and effectively integrate the various scientific, technical, organizational and operational issues relevant to the expansion of JCOMM services, including into non-physical oceanographic areas. To this end it agreed that a small interdisciplinary team could effectively achieve such a goal, but would be anchored in the SCG. The membership should span the services, observational, scientific and operational areas within existing JCOMM organs and related organizations particularly GOOS and its bodies, and operational ocean service groups having considerable expertise in providing and developing new oceanographic services.

Terms of Reference

2. The terms of reference for the task team are:
 - (i) **Purpose:** The task team shall provide a mechanism and forum for requirements for services utilizing all ocean variables, observations, model outputs, etc. to be effectively and directly linked to the planning activities of the Services Coordination Group for formulation of new JCOMM services. It shall take into account relevant activities and plans of groups, bodies or projects such as, *inter alia*, GOOS, OOPC, COOP, GODAE, Argo, new/emerging observation systems including those for chemical and biological variables.
 - (ii) **Membership:** The Team will be chaired by the Chairman of the SCG, and will include the Chairman of the OCG, the Chairman of the OOPC, the Chairman of the JEB Editorial Board, the JCOMM Rapporteur on non-physical oceanographic observations/services, and representatives of key operational ocean services centres selected to provide a sound balance of expertise and geographical coverage. A total membership of up to 10 is envisaged.
 - (iii) **Operation of the Team:** The Team will conduct its business largely by correspondence and will meet where possible, at least partially, during sessions of the Management Committee which the chairs of the SCG, OCG and OOPC and possibly the Rapporteur will be attending.
 - (iv) **Reporting and implementation aspects:** The Team will report to the Management Committee through the SCG. It will make recommendations for further or additional actions required that fall outside the SPA, either in other areas of JCOMM or its related scientific/technical/operational panels or linkages. To the extent possible the SCG will endeavour to establish the framework, mechanisms, systems, etc. to incorporate planned new services into the JCOMM coordination paradigm and to assist, facilitate, advise, encourage, etc. JCOMM Members to implement the new services.
 - (v) **Duration of the Team:** The Team will commence for an indefinite period, subject to a review of its progress and achievements to be presented to JCOMM-II. The Management Committee will advise JCOMM if and how formal representation of the Team in the Commission may be best arranged to provide the most effective coordination as either a temporary or more long term activity within the JCOMM Programme Area framework.

ANNEX VI

LIST OF ACRONYMS

ABE-LOS	Advisory Board of Experts on the Law of the Sea/IOC
ADB	African Development Bank
AUV	Autonomous Underwater Vehicle
CARICOM	Caribbean Community
CB	Capacity Building
CBCG	Capacity Building Coordination Group
CEST	Coastal Environmental Science and Technology (Panel)
CEOS	Committee on Earth Observation Satellites
CLIMAR	Workshop on Advances in Marine Climatology
CLIVAR	Climate Variability and Predictability
COP	Conference of the Parties (of the UNFCCC)
COOP	Coastal Ocean Observations Panel
CSIRO	Commonwealth Scientific and Industrial Research Organization
DANIDA	Danish Agency for International Development
DBCP	Data Buoy Co-operation Panel
DMACS	Data Management and Communication System
DODS/OPeNDAP	Distributed Oceanographic Data System/Open-source Project for a Network Data Access Protocol
EC	European Commission
EC-FP6	European Commission's Framework 6 Programmes
EEZ	Exclusive Economic Zone
ETDMP	Expert Team on Data Management Practices
EuroGOOS	European GOOS
FAO	Food and Agriculture Organization of the United Nations
GCOS	Global Climate Observing System
GDSIDB	Global Digital Sea Ice Data Bank
GE	Group of Experts
GEF	Global Environment Facility
GEO	Global Eulerian Observatory
GLOSS	Global Sea-Level Observing System
GLOBEC	Global Ocean Ecosystems Dynamics
GMACS	GOOS Mechanisms for Advocacy and Communications Support
GMDSS	Global Maritime Distress & Safety System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GOSIC	G3OS Information Centre
GOSUD	Global Ocean Surface Underway Data Project
GPO	GOOS Project Office
GRAs	GOOS Regional Alliances
GRAND	GOOS Regional Alliances Network Development

GSC	GOOS Steering Committee
GTOS	Global Terrestrial Observing System
G3OS	GCOS/GOOS/GTOS
ICES	International Council for the Exploration of the Sea
ICSU	International Council for Science
IGBP	International Geosphere-Biosphere Programme
IGCO	Integrated Global Carbon Observing (Theme)
IGOSS	Integrated Global Ocean Services System
IGOS	Integrated Global Observing Strategy
I-GOOS	Intergovernmental Committee for GOOS
IFREMER	Institut français de recherche pour l'exploitation de la mer
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCCG	International Ocean Colour Coordinating Group
IODE	International Oceanographic Data and Information Exchange
GE-TADE	Group of Experts on Technical Aspects of Data Exchange
IOGOOS	Indian Ocean GOOS
IOI	International Ocean Institute
JAMSTEC	Japan Marine Science and Technology Centre
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMM-DIM	JCOMM Data and Information Management
JCOMM SCG	JCOMM Services Coordinating Group
JCOMMOPS	JCOMM <i>in situ</i> Platform Support Centre
LME	Large Marine Ecosystem
MAN	Management Committee (of JCOMM)
MedGOOS	Mediterranean GOOS
MOU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration/USA
NEAR-GOOS	N. E. Asian Region GOOS
NEPAD	New Partnership for Africa's Development
NOAA	National Oceanic and Atmospheric Administration/USA
NODC	National Oceanographic Data Centre
NORAD	Norwegian Agency for International Development
NSF	National Science Foundation/USA
NORSEPP	North Sea Ecosystem Pilot Project
OAU	Organization of African Unity
OCG	Observations Coordination Group (of JCOMM)
ODAS	Ocean Data Acquisition System
ODIN	Ocean Data Information Network
OIT	Ocean Information Technology Project
OOPC	Ocean Observations Panel for Climate
PICES	North Pacific Marine Science Organization
POGO	Partnership for Observation of the Global Ocean

PSMSL	Permanent Service for Mean Sea-Level
SCG	Services Coordination Group
SERREAD	Scientific Educational Resources and Experience with Deployment of Argo Floats in the Pacific
SIDA	Swedish Development Agency
RSP	Regional Seas Programme
SOOP-IP	Ship-of-Opportunity Programme Implementation Panel
SOT	Ship Observations Team (of JCOMM)
SST	Sea Surface Temperature
TEMA	Training, Education and Mutual Assistance programme (IOC)
TORs	Terms of Reference
TTR	Task Team on Resources
UCT	University of Cape Town
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environment Programme
UNFCCC	United National Framework Convention on Climate Change
VCP	Voluntary Cooperation Programme
VOS	Voluntary Observing Ship
WB	World Bank
WCRP	World Climate Research Programme
WESTPAC	IOC Sub-Commission for the Western Pacific
WIOMAP	Western Indian Ocean Marine Applications Project
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment
WSSD	World Summit on Sustainable Development
XBT	Expendable Bathythermograph
XML	Extendable Make-up Language

In this Series, entitled

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

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

59. Second Session of the IOC-WMO/IGOSS Group of Experts on Operations and Technical Applications
60. Second Session of the IOC Group of Experts on the Global Sea-Level Observing System
61. UNEP-IOC-WMO Meeting of Experts on Long-Term Global Monitoring System of Coastal and Near-Shore Phenomena Related to Climate Change
62. Third Session of the IOC-FAO Group of Experts on the Programme of Ocean Science in Relation to Living Resources
63. Second Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
64. Joint Meeting of the Group of Experts on Pollutants and the Group of Experts on Methods, Standards and Inter-calibration
65. First Meeting of the Working Group on Oceanographic Co-operation in the ROPME Sea Area
66. Fifth Session of the Editorial Board for the International Bathymetric and its Geological/Geophysical Series
67. Thirteenth Session of the IOC-IHO Joint Guiding Committee for the General Bathymetric Chart of the Oceans **(Also printed in French)**
68. International Meeting of Scientific and Technical Experts on Climate Change and Oceans
69. UNEP-IOC-WMO-IUCN Meeting of Experts on a Long-Term Global Monitoring System
70. Fourth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
71. ROPME-IOC Meeting of the Steering Committee on Oceanographic Co-operation in the ROPME Sea Area
72. Seventh Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' **(Spanish only)**
73. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico **(Also printed in Spanish)**
74. UNEP-IOC-ASPEI Global Task Team on the Implications of Climate Change on Coral Reefs
75. Third Session of the IODE Group of Experts on Marine Information Management
76. Fifth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
77. ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area
78. Third Session of the IOC Group of Experts on the Global Sea-level Observing System
79. Third Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
80. Fourteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
81. Fifth Joint IOG-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
82. Second Meeting of the UNEP-IOC-ASPEI Global Task Team on the Implications of climate Change on Coral Reefs
83. Seventh Session of the JSC Ocean Observing System Development Panel
84. Fourth Session of the IODE Group of Experts on Marine Information Management
85. Sixth Session of the IOC Editorial Board for the International Bathymetric chart of the Mediterranean and its Geological/Geophysical Series
86. Fourth Session of the Joint IOC-JGOFS Panel on Carbon Dioxide
87. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Pacific
88. Eighth Session of the JSC Ocean Observing System Development Panel
89. Ninth Session of the JSC Ocean Observing System Development Panel
90. Sixth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
91. First Session of the IOC-FAO Group of Experts on OSLR for the IOCINCWIO Region
92. Fifth Session of the Joint IOC-JGOFS CO₂ Advisory Panel Meeting
93. Tenth Session of the JSC Ocean Observing System Development Panel
94. First Session of the Joint CMM-IGOSS-IODE Sub-group on Ocean Satellites and Remote Sensing
95. Third Session of the IOC Editorial Board for the International Chart of the Western Indian Ocean
96. Fourth Session of the IOC Group of Experts on the Global Sea Level Observing System
97. Joint Meeting of GEMSI and GEEP Core Groups
98. First Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
99. Second International Meeting of Scientific and Technical Experts on Climate Change and the Oceans
100. First Meeting of the Officers of the Editorial Board for the International Bathymetric Chart of the Western Pacific
101. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
102. Second Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
103. Fifteenth Session of the Joint IOC-IHO Committee for the General Bathymetric Chart of the Oceans
104. Fifth Session of the IOC Consultative Group on Ocean Mapping
105. Fifth Session of the IODE Group of Experts on Marine Information Management
106. IOC-NOAA *Ad hoc* Consultation on Marine Biodiversity
107. Sixth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
108. Third Session of the Health of the Oceans (HOTO) Panel of the Joint Scientific and Technical Committee for GLOSS
109. Second Session of the Strategy Subcommittee (SSC) of the IOC-WMO-UNEP Intergovernmental Committee for the Global Ocean Observing System
110. Third Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
111. First Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate
112. Sixth Session of the Joint IOC-JGOFS CO₂ Advisory Panel Meeting
113. First Meeting of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS)
114. Eighth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño" **(Spanish only)**
115. Second Session of the IOC Editorial Board of the International Bathymetric Chart of the Central Eastern Atlantic **(Also printed in French)**
116. Tenth Session of the Officers Committee for the Joint IOC-IHO General Bathymetric Chart of the Oceans (GEBCO), USA, 1996
117. IOC Group of Experts on the Global Sea Level Observing System (GLOSS), Fifth Session, USA, 1997
118. Joint Scientific Technical Committee for Global Ocean Observing System (J-GOOS), Fourth Session, USA, 1997
119. First Session of the Joint 100-WMO IGOSS Ship-of-Opportunity Programme Implementation Panel, South Africa, 1997
120. Report of Ocean Climate Time-Series Workshop, Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate, USA, 1997

121. IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS), Second Session, Thailand, 1997
122. First Session of the IOC-IUCN-NOAA *Ad hoc* Consultative Meeting on Large Marine Ecosystems (LME), France, 1997
123. Second Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), South Africa, 1997
124. Sixth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico, Colombia, 1996 **(also printed in Spanish)**
125. Seventh Session of the IODE Group of Experts on Technical Aspects of Data Exchange, Ireland, 1997
126. IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), First Session, France, 1997
127. Second Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 1998
128. Sixth Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1997
129. Sixth Session of the Tropical Atmosphere - Ocean Array (TAO) Implementation Panel, United Kingdom, 1997
130. First Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 1998
131. Fourth Session of the Health of the Oceans (HOTO) Panel of the Global Ocean Observing System (GOOS), Singapore, 1997
132. Sixteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), United Kingdom, 1997
133. First Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1998
134. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IOC/EB-IBWIO-IW3), South Africa, 1997
135. Third Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), France, 1998
136. Seventh Session of the Joint IOC-JGOFS C02 Advisory Panel Meeting, Germany, 1997
137. Implementation of Global Ocean Observations for GOOS/GCOS, First Session, Australia, 1998
138. Implementation of Global Ocean Observations for GOOS/GCOS, Second Session, France, 1998
139. Second Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Brazil, 1998
140. Third Session of IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), China, 1998
141. Ninth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Ecuador, 1998 **(Spanish only)**
142. Seventh Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Croatia, 1998
143. Seventh Session of the Tropical Atmosphere-Ocean Array (TAO) Implementation Panel, Abidjan, Côte d'Ivoire, 1998
144. Sixth Session of the IODE Group of Experts on Marine Information Management (GEMIM), USA, 1999
145. Second Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), China, 1999
146. Third Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Ghana, 1999
147. Fourth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC); Fourth Session of the WCRP CLIVAR Upper Ocean Panel (UOP); Special Joint Session of OOPC and UOP, USA, 1999
148. Second Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1999
149. Eighth Session of the Joint IOC-JGOFS CO2 Advisory Panel Meeting, Japan, 1999
150. Fourth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Japan, 1999
151. Seventh Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1999
152. Sixth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 1999
153. Seventeenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), Canada, 1999
154. Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y el Golfo de Mexico (IBCCA), Septima Reunión, Mexico, 1998
IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA), Seventh Session, Mexico, 1998
155. Initial Global Ocean Observing System (GOOS) Commitments Meeting, IOC-WMO-UNEP-ICSU/Impl-III/3, France, 1999
156. First Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Venezuela, 1999 **(also printed in Spanish and French)**
157. Fourth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), China, 1999
158. Eighth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Russian Federation, 1999
159. Third Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), Chile, 1999
160. Fourth Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS). Hawaii, 2000
161. Eighth Session of the IODE Group of Experts on Technical Aspects of Data Exchange, USA, 2000
162. Third Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 2000
163. Fifth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Poland, 2000
164. Third Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 2000
165. Second Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Cuba, 2000 **(also printed in Spanish and French)**
166. First Session of the Coastal Ocean Observations Panel, Costa Rica, 2000
167. First GOOS Users' Forum, 2000
168. Seventh Session of the Group of Experts on the Global Sea Level Observing System, Honolulu, 2001
169. First Session of the Advisory Body of Experts on the Law of the Sea (ABE-LOS), France, 2001 **(also printed in French)**
170. Fourth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, Chile, 2001
171. First Session of the IOC-SCOR Ocean CO₂ Advisory Panel, France, 2000
172. *Cancelled*
173. Third Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, USA, 2001 **(also printed in Spanish and French)**
174. Second Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Italy, 2001
175. Second Session of the Black Sea GOOS Workshop, Georgia, 2001
176. Fifth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2000

177. Second Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Morocco, 2002 (**also printed in French**)
178. Third Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Vietnam, 2002
179. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002
180. Second Session of the IOC-SCOR Ocean CO₂ Advisory Panel, Honolulu, Hawaii, U.S.A, 2002 (**electronic copy only**)
181. IOC Workshop on the Establishment of SEAGOOS in the Wider Southeast Asian Region, Seoul, Republic of Korea, 2001 (SEAGOOS preparatory workshop) (**electronic copy only**)
182. Third Session of the GOOS Users' Forum and Coastal Ocean Observations Panel, Vietnam, 2002
183. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002
184. Seventh Session of the IODE Group of Experts on Marine Information Management (GEMIM), France, 2002 (**electronic copy only**)
185. Sixth Session of IOC/WESTPAC Coordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2001
186. First Session of the Global Ocean Observing System (GOOS) Capacity Building Panel, Switzerland, 2002 (**electronic copy only**)
187. Fourth Session of the ad hoc Advisory Group for IOCARIBE-GOOS, 2002, Mexico (**also printed in French and Spanish**)
188. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO), Mauritius, 2000
189. Third session of the Editorial Board for the International Bathymetric Chart of the Western Pacific, China, 2000
190. Third Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Vietnam, 2002
191. Eighth Session of the IOC Consultative Group on Ocean Mapping, Russian Federation, 2001
192. Extraordinary Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Chile, 1999 (**Spanish only; electronic copy only**)
193. Third Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Lisbon, 2003 (**also printed in French**)
194. Fifth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, France, 2002
195. Sixth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, South Africa, 2003