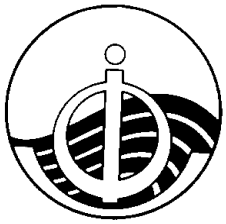
Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies



Twentieth Session of the Assembly

Paris, 29 June - 9 July 1999

UNESCO

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IOC-XX/3
Paris, 20 August 1999
Original: English/French/Spanish

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SUMMARY REPORT

ANNEXES

1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SESSION

1 The Chairman, Mr Geoffrey Holland, opened the Twentieth Session of the IOC Assembly at 10.00 on 29 June 1999.

2 **The Assembly received** and **noted with appreciation** statements by the Chairman and, by Dr Patricio Bernal, Executive Secretary IOC and Assistant Director-General of UNESCO on behalf of the Director-General of UNESCO who was involved with the World Science Conference in Budapest. Their statements are given in Annex III, Parts A and B.

3 The Director-General of UNESCO, Mr Federico Mayor addressed the Assembly at a later date in the proceeding of the Session. At that time, recalling that a growing population live on the interface between land and sea, he particularly stressed the importance of addressing social aspects while providing decision-makers with elements based on scientific exactness. He further expressed his support to the development of a regional approach in terms of programme and structure.

4 **The Assembly also took** notice of the shortening of the meeting from the traditional three weeks to two. Several delegations welcomed this initiative and expressed their satisfaction for this decision reflecting a trend toward increased efficiency in the administrative working of the Commission.

5 Other delegations expressed warning on the heavier burden on the Secretariat to improve general planning, especially in the preparation of documents.

6 The Executive Secretary IOC noted that an exhibition had been arranged in the area outside the hall used for the Assembly, to highlight products of the International Year of the Ocean, and to give live demonstrations of some of the IOC and related products that were now available on CD-ROM and through the Internet. An e-mail facility was also provided for the delegates' use.

1.2 BRUUN AND PANIKKAR MEMORIAL LECTURES

7 **The Assembly noted** that the Bruun Lecture would be given by Dr John Woods, Professor of Oceanography at Imperial College, London, on *Ocean Predictability*, and the Panikkar Lecture would be given by Dr Nobuo Shuto, Professor at Iwate Prefectural University from Japan, on the *Tsunami Numerical Simulation* (see Annex V).

1.3 ADOPTION OF THE AGENDA

8 **The Assembly adopted** the Agenda as given in Annex I.

1.4 DESIGNATION OF THE RAPPORTEUR

9 **The Assembly gratefully accepted** the offer by the Russian Federation to provide the Rapporteur. Dr Evgueni Kontar was appointed.

1.5 ESTABLISHMENT OF INTRASESSIONAL COMMITTEES

10 **The Assembly noted** that under Rule of Procedure No. 12(2), the Executive Council, acting as the Steering Committee for the Assembly, had appointed a Nominations Committee for the

Assembly with the following composition: Poland (Chairman), Algeria, China, Colombia, France, Japan, Nigeria, Russian Federation and Turkey.

11 As proposed by the Executive Council, **the Assembly accepted** the establishment of a Technical Review Committee for Recommendations and Resolutions with the following composition: Cuba (Co-Chair), Kenya (Co-Chair), Algeria, Brazil, China, France, Indonesia, Mexico, Russian Federation and United States of America.

12 The Chairman announced that two additional committees would work intrasessionally: (i) to look at the changes in IOC Statutes recommended by the DOSS-2 Committee, and which would be chaired by Costa Rica; and (ii) a Programme and Budget Committee, which would be chaired by Cuba. **The Assembly noted** that these committees would be open-ended and would meet at times to be announced.

13 **The Assembly noted** the Chairman's request that in order to make the plenary meeting as efficient and effective as possible given the new time constraint, the Chairmen of Regional Bodies should arrange intrasessional meetings to debate regional priorities and agree on the decisions that needed to be addressed by the Assembly under Agenda Item 6.

1.6 INTRODUCTION OF TIMETABLE AND DOCUMENTATION

14 The Executive Secretary introduced the documentation, noting that the main change is the presentation of an action paper instead of the usual annotated provisional agenda. **The Assembly adopted** the Provisional Timetable (Document IOC-XX/1 Add. prov. rev.). The list of documents is given in Annex VIII, the List of Participants in Annex IX and the List of Acronyms in Annex X.

15 Member States expressed disappointment that more documentation was not available in French. The Secretariat has endeavoured to provide the working documents in the four working languages in advance, but shortages of human resources both within the IOC and UNESCO have made it difficult to achieve this in a timely manner, especially since some of the meetings being reported on have only taken place recently. There is a queue for UNESCO and IOC documents to be translated.

2. REPORTS

2.1 REPORT OF THE EXECUTIVE SECRETARY ON INTERSESSIONAL ACTIVITIES: 1997 – 1998

16 The Executive Secretary IOC, Dr P. Bernal, presented his report on activities since the Nineteenth Session of the Assembly (1997) and the Thirty-first Session of the Executive Council (1998), referring to the 1998 Annual Report and its addendum. He stressed the amount of effort that was invested in the preparation of the Annual Report in its new format, which will improve the dissemination of the objectives and importance of IOC programmes to a wider audience.

17 The Executive Secretary first focused on the UNESCO institutional framework in which IOC is operating. The Medium Term Strategy for 1996-2001 (Document 29 C/4) required significant adjustments in the programmes of UNESCO, for generating policy shaping and issue-oriented actions in support, and at the request, of Member States.

18 IOC, being a body with functional autonomy within UNESCO, has implemented this new strategy in the last two biennial Programmes and Budgets of UNESCO, the 29 C/5 for years 1998-1999, and the currently discussed draft 30 C/5 for years 2000-2001.

19 IOC is increasingly called to play an important role in the UN system, to fulfill the mandates of higher bodies of the UN such as the UN Commission on Sustainable Development, established by UNCED. However, UN agencies are now faced with the reality in which the UN operates and the financial restrictions that reduce its ability to implement activities. A report of the previous Executive Secretary IOC to the Assembly had noted that often only half of the required resources were available for programme implementation. Continuing financial pressure is likely to lead to probable reduction of UNESCO programme funds for the next biennium. UN agencies are becoming more policy oriented; they are making efforts to define their mandates more clearly, and are increasing inter-agency collaboration. This process is being applied to UNESCO and IOC. At the same time, new funding mechanisms were established to address Agenda 21 implementation, based on the requirements of global Conventions. The Global Environmental Facility (GEF) represents such a mechanism.

20 For IOC to benefit from these mechanisms, it has to generate partnerships amongst Member States. The Global Ocean Observing System (GOOS) is being recognized by several Conventions as a potential source for technical and scientific information on the marine environment, and the possibility now exists for the IOC and Member States to exploit such financial facilities to develop their capacity for benefiting of and participating to global observing systems.

21 The Executive Secretary noted that IOC now has a more significant role in the ACC Sub-Committee on Oceans and Coastal Areas of the Administrative Committee on Co-ordination (ACC-SOCA). The ACC-SOCA is composed of eight agencies from the UN system, as well as representatives from the World Bank and the secretariats of the Conventions on Biological Diversity and Climate Change. Beginning cross-agency co-ordination in the ACC-SOCA has not been easy, as each agency has its own governing body and priorities, and there are no financial incentives to promote inter-agency co-operation. During the last meeting of the ACC-SOCA in February 1999, IOC was invited to take the Chairmanship as well as provide the secretariat of this co-ordinating committee. It is hoped that these new developments will assist relevant agencies in defining priorities and regional programmes that could be implemented across the borders of agency mandates. This process has begun through the IOC contribution to the Global Plan of Action for the Protection of the Marine Environment from Land-Based Activities (GPA-LBA).

22 The Executive Secretary recalled some highlights of the intersessional period, in particular the success of the 1998 International Year of the Ocean (IYO), which was clear from the involvement of several segments of society in this global public awareness exercise. The IYO helped IOC to gain recognition and momentum within the UN system and outside. IOC increased the scope of its partnerships in the implementation of the Commission's programme. The Partnership for Observation of the Global Oceans (POGO) is being established by a number of oceanographic research institutions following a meeting at UNESCO/IOC in Paris in early 1999. This partnership will enable ocean institutions to work together more closely in the future to develop global ocean observation capacity and carry out pre-operational research in support of GOOS. GOOS itself also gained considerable visibility during the IYO.

23 IOC is initiating co-operation with the technology sector of industry, and will promote the involvement of industry in the implementation of ocean observing systems. Initial contacts have been made with the military sector, taking into account the major role that navies play in the

collection and gathering of oceanographic data. IOC will work with them to encourage release of oceanographic data for the benefit of the international community.

24 Finally, the Executive Secretary reviewed the restructuring of the Secretariat undertaken during the intersessional period. Reporting lines have been streamlined. The Secretariat has been reorganized into three Sections, each headed by a senior staff member at the P-5 level. These are: *Ocean Sciences*, *Operational Observing Systems*, and *Ocean Services*. A senior staff group has been established and is working closely with the Executive Secretary to formulate policy and to oversee programme co-ordination. Three staff members retired between 1998-1999. Two new staff members were welcomed during the same period.

25 In concluding the Executive Secretary stressed that IOC is facing a credibility gap which needs to be overcome. This is mainly due to the lack of resources available for the implementation of programmes and for the provision of staff. IOC will need to reinforce its credibility with funding agencies and development banks. This will require a more professional management approach in the Secretariat as well as the assistance of Member States.

26 **The Assembly expressed** its satisfaction with the IOC programme implementation and the changes that IOC has made since the Nineteenth Session of the Assembly, in particular in light of the very limited resources that are available. It congratulated the Executive Secretary on the new version of the Annual Report, and welcomed the proposal to include as an annex to the Assembly Report, information on national activities conducted in the intersessional period as contributions to IOC programmes (Annex VI).

27 **The Assembly was pleased** to note that certain priority areas within the IOC have been developed, in particular operational oceanography through the GOOS mechanism; the provision of scientific input under-pinning coastal area management and sustainable development; and the transfer of scientific knowledge and capacity building. Many delegations also expressed great satisfaction with the IYO, and its contribution to the enhanced visibility of IOC.

28 Many delegates welcomed the intention of establishing working linkages at the international level and the initiation of new partnerships with industry and the military. However, they stressed the need of IOC to maintain its independence and co-ordinating role specially when co-operation with the military is pursued.

29 Delegates supported the role that IOC is playing in the ACC-SOCA trying to enhance system-wide co-ordination. Its close co-operation with UNEP in the PACSICOM process and with WMO in the implementation of Global Ocean Observations of GCOS/GOOS was applauded.

30 In order to develop the Commission's activities and increase the credibility of IOC, many delegates emphasized the need to strengthen co-ordination and implementation of activities in the regions. Without firm commitments from Member States, the strengthening of regional programmes will be difficult in the context of limited funds and high regional priorities.

31 Delegates stressed the need for IOC to reinforce the linkages and interactions with the UNESCO sectors of Culture, Education and Science for programme implementation, and with the UNESCO Governing Bodies for institutional and decision-making purposes.

32 **The Assembly concluded** the discussion on this item by endorsing the Annual Report for 1998, with the minor amendments brought up in the debates. **The Assembly thanked** the Executive Secretary and the Secretariat for their good work.

2.2 PROGRESS REPORT ON THE BUDGET EXECUTION

33 In introducing this item, Mrs C. Grignon-Logerot, Senior Administrative Officer, referred to Document IOC-XX/2 Annex 1. She provided an overview of the current status of revenue and expenditure from the IOC Regular Programme and the IOC Trust Fund special account, as of 1 May 1999. Following this presentation, Dr P. Bernal provided information on staffing and on the new structure of the IOC Secretariat.

34 In the debate which followed, **the Assembly congratulated** the Secretariat on its accurate and clear report. During the ensuing discussion, clarification was given in response to several specific questions raised in regard to Document IOC-XX/2 Annex 1, particularly on the respective importance of the sciences and services and the position of TEMA which interconnects with every programme and activity and cuts across the proposed administrative structure. **The Assembly reiterated** the importance of capacity building as a major component of the IOC activity and integral to each IOC programme.

35 **The Assembly established** a sessional drafting group chaired by the First Vice-Chairman for Agenda Items 2.2 and 2.3, with a view to preparing a draft resolution on the IOC Programme and Budget for 2000-2001.

2.3 INTRODUCTION OF THE PROGRAMME AND BUDGET FOR 2000-2001

36 Mrs C. Grignon-Logerot introduced this item, provided a brief overview of Document IOC-XX/2 Annex 10 on the draft IOC Programme and Budget 2000-2001, and referred to the recommendations of the UNESCO Executive Board on the UNESCO Draft Programme and Budget for 2000-2001 that are relevant to IOC.

37 **The Assembly noted** with deep concern the problem of staffing the regional secretariats in the IOCARIBE and WESTPAC Sub-Commissions. **The Assembly stressed** that the abolition of the professional post originally transferred from Djakarta to Bangkok to support the WESTPAC Secretariat and the continuing temporary situation in Cartagena would have strong negative consequences on the staffing situation of the Commission within and outside headquarters.

2.4 REPORT ON THE *AD HOC* STUDY GROUP ON IOC DEVELOPMENTS, OPERATIONS, STRUCTURE AND STATUTES

38 The Chair referred to the Assembly Resolutions XVIII-1 and XIX-15 of the IOC Assembly and the recommendations of the Thirty-second Session of the IOC Executive Council on this agenda item (Document IOC/EC-XXXII/3). The Executive Council decided to recommend to the Assembly that a change to the name of IOC, although not included in the proposed amendments to the statutes, was a relevant question that should be dealt with in a substantial manner in the future.

39 Dr Manuel Murillo, Chairman of the *Ad hoc* Study Group on IOC Developments, Operations, Structure and Statutes (DOSS-2), presented briefly the report indicating the decision of the IOC Assembly taken in 1995 to continue the work of the *Ad hoc* Study Group on DOSS with a

view to presenting a final report to this IOC Assembly. The responsibilities and objectives of the *Ad hoc* Study Group are presented in Resolution XVIII-1.

40 In order to carry out its wide-ranging mandate, the *Ad hoc* Study Group held four plenary meetings in 1996-1998, and in August 1996 a sub-group met in Lisbon to look at the theme of financial contributions and options for the establishment of a contribution system for Member States.

41 To date, the *Ad hoc* Study Group has produced four progress reports. The first was brought before the IOC Executive Council at its Twenty-ninth Session, in October 1996, the second was submitted to the Nineteenth Session of the Assembly, in July 1997, the third one to the Thirty-first Session of the Executive Council in 1998 and the last one to this Twentieth Session of the Assembly.

42 At its thirty-first session, the Executive Council recommended that comments received from Member States on the progress report of 1998 and the proposed amended Statutes of the Commission be compiled into a document which has been made available for this Assembly as Document IOC-XX/2 Annex 2.

43 **The Assembly decided** to establish a sessional working group with a view to preparing a draft resolution including the text of the proposed amended Statutes of the Commission for consideration by the 30th General Conference of UNESCO, taking into account the results of the debate in the plenary of the Thirty-second Executive Council and the recommendations of the Thirty-first Executive Council.

44 Dr Manuel Murillo was invited to chair the sessional group. The sessional working group met three times. The representatives of the following countries attended: Argentina, Brazil, Canada, Costa Rica, Cuba, France, Germany, India, Norway, Portugal, Russian Federation, Turkey, UK and the USA. A consensus was reached although some countries registered their reservations.

45 The Delegate of Turkey requested inclusion in the text of the report the following: "*Turkey's acceptance of the amended Statutes of the Intergovernmental Oceanographic Commission which makes a reference in Article 3/1(C) to the UN Convention on the Law of the Sea (UNCLOS) should not be interpreted as a change in Turkey's position regarding this convention to which Turkey is not a party. Furthermore, any reference to the UNCLOS in this text, would not create any right or obligation on the part of Turkey*".

46 France wished to see included in Article 8, paragraph 2, of the draft revised Statutes, an explicit reference to the UNESCO rules and regulations as the legal framework for exercise of the authority of the Director-General of UNESCO to appoint the Executive Secretary IOC.

47 Greece supported the text but expressed its reservation regarding the use of the phrase "coastal areas" into the text of the Draft Resolution.

48 **The Assembly requested** the *Ad hoc* Study Group for DOSS-2 to complete its mandate, in particular to recommend changes to the rules of procedure, and report back to the Thirty-third Session of the Executive Council.

49 **The Assembly adopted** Resolution XX-1.

3. OCEAN SCIENCES

3.1 OCEANS AND CLIMATE, OCEANS AND GLOBAL CHANGE

3.1.1 WCRP

50 Dr John Gould, Director of the WOCE and CLIVAR International Project Offices (IPOs) opened his presentation with a recent newspaper headline of a climate related disaster, typifying the increasing societal human and economic impact that climate change is generating. This kind of news is fostering a rapidly growing awareness of the importance of developing mitigating options based on sound climate research that the WCRP is pursuing. Dr Gould reminded the Assembly of the WOCE objectives and illustrated how far WOCE had come in meeting its objectives up to the present. It has produced a valuable global data set and developed a suite of models capable of resolving a range of time and space scales that include features like eddies and boundary currents. It has also pushed the observation technology to a new level and the first scientific results show that the deep ocean exhibits much greater variability than expected. All of these WOCE developments are central to the design and implementation of GOOS. GOOS owes WOCE a debt of gratitude for this important legacy. The on-going Analysis, Interpretation, Modelling and Synthesis (AIMS) phase of WOCE promises an expansion of this legacy.

51 Dr Gould went on to describe the CLIVAR programme and its principle research areas. The average temperatures of recent years have shown an anomalous rapid rise and have already exceeded those of any warm years in the 1000-year past. This underscores the need for a programme like CLIVAR to attribute the causes and understand the impacts over seasonal to interannual to decadal time scales. Recent modelling results have shown relationships between droughts and floods, monsoon onsets and strength, and other climatic phenomena with what is happening in the ocean. But the data are not available to verify these model results. With the observing networks to be implemented for CLIVAR and GOOS, model results will enjoy more credibility, thus lessening the uncertainties that policy makers face today.

52 Dr Gould reminded the delegates that CLIVAR is bigger by far than any international programme ever attempted. It attracted more than 60 countries at the CLIVAR Conference held in December last year in UNESCO. This large effort requires an expanded co-ordinating infrastructure, the cost of which is miniscule compared to the total cost of CLIVAR. The IOC contribution to the WCRP is heavily relied on to maintain the current infrastructure, and Dr Gould urged the Member States to increase their contributions so that CLIVAR can be run efficiently. He noted that regional extensions of the CLIVAR International Project Office (IPO) are planned with regional offices. Latin America seem best poised to benefit from such an office right away. Dr Gould asked the nations in that region to consider that even small contributions from every country, in sum can make a big difference. **The Assembly urged** the delegates to take this message back to their governments in the context of the enormous potential costs of climate change impacts. Dr Gould's presentation struck a chord and **the Assembly requested** him to make the transparencies he used available on the Web.

53 The Member States recognized that there is a growing body of evidence directly linking climate variability to societal impacts that have enormous economic consequences. They also appreciated that the WCRP and GOOS were central to developing mitigation options for governments, and that the results of the WCRP underpin the climate module of GOOS.

54 **The Assembly endorsed** a strong continuing IOC commitment of support to the WCRP and urged expanded support at the national and international level for CLIVAR and WOCE. It called upon Member States to co-operate to strengthen regional capabilities by contributing secondments or other resources to the establishment of regional project offices, starting with Latin America, to co-ordinate planning and implementation consistent with WCRP/CLIVAR plans and regional priorities.

3.1.2 OOPC and GODAE

55 Mr Alexiou, from the Ocean Sciences Section of the IOC Secretariat, briefed the Assembly on the impressive progress being made by the GOOS-GCOS-WCRP sponsored Ocean Observation Panel for Climate (OOPC) in developing the Climate module of GOOS. Acting on guidance from its parent bodies the Panel is taking pains to be inclusive in its efforts. Inclusiveness is critical to building the consensus essential to implementing and maintaining GOOS. Toward this end, the OOPC is organizing jointly with the Upper Ocean Panel of CLIVAR, OCEANOBS'99, a major international Conference on Ocean Observations for Climate for 18-22 October this year in St. Raphaël, France. It will be hosted by CNES, the French space agency. It has over 20 other sponsors. The following Web sites can provide additional information:

http://OCEANOBS99.cls.fr and http://WWW.BoM.GOV.AU/OCEANOBS99

56 The Initial (ocean) Observing System developed by OOSDP/OOPC, and recommended by GCOS/GOOS, is now within reach.

57 The prospects for implementing some of the important recommended enhancements are also brighter as the Global Ocean Data Assimilation Experiment (GODAE) gathers steam. GODAE has been devoting effort to better define the kinds of products that should be produced, the data policy, and the modelling needs.

58 GODAE modelling data and products will be exchanged freely and made available to the widest possible community since this is an indispensable condition for the success of the project. It is therefore intended to install a server that is exclusive to GODAE. The proposal by the United States to host this server and the related structure at Fleet Numerical Meteorology and Oceanography Centre in Monterey, California, is currently being examined.

59 Consideration is being given to measure how well the GODAE system is functioning, and how to develop better working linkages between the various communities contributing to or using GODAE products.

60 Preparation of a GODAE Strategic Plan is underway. Separate plans are envisioned for each of the pilot projects, the first of which is the plan for the Array for Real-time Geostrophic Oceanography (Argo) experiment. The GODAE Science Team concluded on the basis of known national intentions that Argo was doable.

61 Mr Yves Desaubies, Director of the French Physical Laboratory for Oceans of IFREMER, briefed the Panel on Argo, concentrating on the science issues. Argo hopes to establish a global array of 3,000 autonomous profiling floats with a 3 degree spacing. These floats can be programmed on deployment to dive to a preset depth of say 1,000 or 2,000 metres where they drift with the current for 10 to 15 days and then rise to the surface. During their ascent they will record temperature and salinity. Upon reaching the surface they will transmit their stored data by satellite

and continue this cycle unattended for several years. This new technology makes the oceanographer's and modeller's expectations of a global, real-time reporting network on the state of the ocean an economic practicality. The Assembly was invited to endorse the Argo concept as well as wholehearted co-operation from all the Member States in implementing the experiment.

62 Some delegations expressed concern with legal aspects related to the use of autonomous profiling floats related to the possibility of their entering into waters under national jurisdiction.

63 The Delegate from the USA invited all delegations to ensure that their atmospheric weather forecast services are made aware of CLIVAR and GODAE and the real-time data that will result from the Argo global array of floats. These programmes are laying the basis for improved seasonal and interannual climate forecasts. With such connections established, the value of ocean observations to the economic security of each country can be effectively demonstrated.

64 The delegates applauded the rapid progress in developing the Ocean Climate Module by the OOPC. **The Assembly strongly endorsed and encouraged** continuation of the Panel's consensus-building efforts (e.g. OCEANOBS'99) to involve the full range of players, in operations and research, in implementation of the global ocean and climate observing system.

65 **The Assembly expressed satisfaction** and pleasure with the progress in developing GODAE. It concurred with the course being taken to thoroughly examine and plan for every step in the end-to-end concept to assure smooth operation of the system and to build in mechanisms for assessing the performance of the system. It looked forward to the completion of the GODAE Plan.

66 **The Assembly endorsed** Argo as a contribution of CLIVAR and as a pilot component of GOOS. It called on Member States to support Argo by whatever means they can, through: deployment of their own sets of floats; data analysis; assisting other nations with the logistics of deployment in their regions, and through capacity building activities and, in general, through committed co-operation in the implementation of the programme.

67 **The Assembly adopted** Resolution XX-6.

3.1.3 Ocean CO_2

68 Mr Alexiou, from the IOC Secretariat, also reported that the joint IOC-JGOFS Ocean CO_2 Advisory Panel had successfully completed its task to oversee the assembling of the most accurate and consistent global data set of CO_2 ever attempted *via* a global ocean CO_2 survey, in co-operation with WOCE. It was time now to establish a new Panel with new terms of reference (TOR) and new members with skills consistent with the new TOR. IOC intends to negotiate this new TOR with SCOR and JGOFS. **The Assembly emphasized** that the IOC has a continuing need for access to ocean CO_2 expertise, e.g. the issue of CO_2 sequestration in the deep ocean, and OOPC/GOOS needs for advice on CO_2 observation requirements.

69 **The Assembly endorsed** the proposal to terminate the present IOC-JGOFS Ocean CO_2 Advisory Panel and develop with SCOR/JGOFS a new Panel with a new membership consistent with the new terms of reference that reflect the IOC needs for ocean CO_2 expertise.

3.2 ICAM AND OTHER COASTAL ZONE PROGRAMMES, INCLUDING OSNLR

70 Mr Julian Barbière, Technical Secretary for Integrated Coastal Area Management (ICAM) Programme, introduced this agenda item by referring to the 1998 Annual Report and Document IOC/INF-1121 on the OSNLR Expert Consultation. He recalled the adoption by the Executive Council of Resolution EC-XXXI.5 entitled "Marine Science and Observation Inputs to Integrated Coastal Area Management (ICAM)", which establishes the IOC/ICAM programme.

71 The objective of the programme is to assist IOC Member States in their efforts to build marine scientific and technological capabilities in the field of ICAM, and ensure that marine sciences are integrated into the development of national and regional ICAM programmes and plans. The programme is progressively expanding, interacting with, and complementing IOC marine science programmes such as OSNLR, OSLR and GIPME, as well as the Coastal Module of GOOS. The strategy was presented by the Secretariat during the regional committee meetings of IOCARIBE-VI and WESTPAC-IV in 1999. Several activities have been identified in the context of the IOC/ICAM programme, including the establishment of regional working groups to oversee the implementation of ICAM activities.

72 The Technical Secretary reviewed the various ICAM-related activities carried out by IOC during the intersessional period and gave a brief overview of co-operation activities with other institutions, such as the organization of a major IOC-SOA (State Oceanic Administration, China) Workshop on World's Coastal Megacities, to take place in Hangzhou, China in September 1999, with the co-operation of the IOI, UNESCO/CSI, MOST and UNEP. Other co-operative activities include the establishment of a joint project with the International Geographical Union, which should bring together the expertise of natural and social sciences in the field of ICAM. The Land Ocean Interaction in the Coastal Zone (LOICZ) of IGBP is also considered as a major partner in the investigation of coastal processes. He also noted the on-going co-operation with NOAA and the University of Delaware (USA) to construct and maintain a Web site as a tool clearinghouse for practitioners.

73 The Technical Secretary then referred to the OSNLR Group of Experts Consultation called for by the Nineteenth Assembly with a view to identifying the specific contributions of OSNLR to coastal zone management. There was consensus among the experts that OSNLR can also be an integral part of programmes relative to ICAM and GOOS. He reported on the activities that took place under this programme and drew the attention of the Assembly to the fact that the seconded staff member responsible for the programme left in December 1998 and the programme suffered from this.

74 The Assembly was invited to consider ways and means to integrate OSNLR in the global IOC strategy relative to the coastal zone and to improve the support of OSNLR at global, regional and national levels, particularly for developing countries.

75 Many delegations provided information on national and regional activities and initiatives related to integrated coastal area management, including the establishment of new institutions, the development of national ICAM plans, research and monitoring projects related to coastal zone management, and the carrying out of training courses, workshops, seminars such as the above mentioned IOC-SOA Workshop on World’s Coastal Megacities, and the International Training Workshop on ICAM and its Integration with Marine Sciences (St. Petersburg, Russia, September 2000). The Delegate of the Russian Federation suggested establishing, under the auspices of the

IOC, a regional research training centre in Gelendjik on the application of physical methods to deal with ecological issues of the coastal zone.

76 Delegates realized the complexities of issues related to coastal zone management, and particularly in achieving interdisciplinarity. The newly established co-operation with more social science oriented programmes such as the International Geographical Union, and the International Ocean Institute (IOI) was welcomed. Stronger links and a better-defined relationship with the Coastal Module Panel of GOOS (C-GOOS) should be worked out with a view to developing a joint strategy.

77 Several delegations emphasized the need for effective co-ordination amongst competent UN agencies and NGOs that are working with ICAM-type issues, so as to avoid overlapping activities, and reinforce a harmonized approach to coastal zone issues. In this respect, **the Assembly welcomed** the role of the IOC in the UN ACC Sub-Committee on Ocean and Coastal Areas, **and invited** its Secretariat to play a key co-ordinating role within the competent UN agencies in terms of marine sciences and ICAM.

78 The Representative of SCOR stressed that the organization is increasingly focussing on coastal zone science. The Representative recalled that SCOR was a co-sponsor of the first COASTS Workshop and noted that, if SCOR is going to be a co-sponsor of the 2000 COASTS Workshop, it needs to be officially invited to participate in the planning process.

79 The Representative of the Unit of Coastal Areas and Small Islands (UNESCO) informed the Assembly of several intersectoral sustainable coastal development projects in which IOC is participating through its ICAM component. The International Union of Technical Associations and Organizations (UATI) Representative gave a short description of his organization, and expressed an interest to work in coastal zone issues jointly with UNESCO.

80 **The Assembly expressed** its appreciation to France for providing support to the realization of the *Methodological Guide on ICAM* as well as the *Atlas on the Shallow Areas of the Seychelles*, **and invited** the Secretariat to carry out similar initiatives in other SIDS.

81 **The Assembly recognized** the importance of ICAM as a new programme of importance to all Member States **and expressed** its satisfaction with the IOC initiative to have a well co-ordinated and focused ICAM programme.

82 **The Assembly recognized** the importance of the OSNLR programme, particularly in regard to the study of sedimentation processes, deep-seabed investigation, and continental shelf delimitation. **The Assembly urged** the Executive Secretary to revitalize the programme and to report on progress at the next Assembly.

83 The Delegation of the Russian Federation, supported by USA, Portugal, Chile, Japan, Ukraine and SCOR, proposed to the Assembly the initiation of a Project on Measurement and Management of Submarine Groundwater Discharge in the Coastal Zone, as a sub-project of IOC/ICAM. This project should be co-ordinated by IOC, in close co-operation with LOICZ, and SCOR of ICSU and with the International Hydrological Programme (IHP) and CSI of UNESCO.

84 **The Assembly adopted** Resolution XX-2.

3.3 MARINE POLLUTION RESEARCH AND MONITORING

85 The Chairman of GIPME, Dr Michael Bewers, introduced the agenda item by making reference to recent activities carried out under the GIPME framework, noting that the IOC 1998 Annual Report describes many of the activities in greater detail. In addition to the Action Paper, the Assembly's attention was drawn to Document IOC-XX/2 Annex 3, *Recommendations of GIPME Officers for the Restructuring of the GIPME Programme*.

86 Dr Bewers recalled that GIPME is co-sponsored by IOC, UNEP and IMO with objectives as stated in Document IOC-XX/2 Annex 3. He further recalled that Resolution XIX-4 of the IOC Assembly established a GIPME Expert Scientific Advisory Group (GESAG) to undertake further developments and implementation of the GIPME Programme. Pursuant to this resolution, a GIPME Officers Meeting was held in London in December 1998 to review the GIPME Programme and to prepare steps for its restructuring as required by Assembly Resolution XIX-4.

87 Dr Bewers referred to the report of the GIPME Officers' meeting and the recommendations contained therein. He pointed out that detailed restructuring of the GIPME Programme, which requires the concurrence of the three co-sponsoring agencies, IOC, IMO and UNEP, was planned for a GESAG meeting in April 1999. However, because the reorganization of UNEP is taking longer than anticipated, this meeting has been deferred until both the Division and individual in UNEP responsible for the GIPME Programme have been identified. It was therefore proposed that the detailed restructuring of GIPME be undertaken in draft form during mid-1999 in preparation for a GESAG meeting that will be convened once the UNEP reorganization has been completed.

88 The Director of the IAEA Marine Environmental Laboratory (MEL), Dr Hugh Livingston, presented a summary of the activities of MEL and its contributions to IOC, particularly the GIPME Programme. It appears that renewal of UNEP support for the non-nuclear elements of MEL activities, specifically MESL, will occur during 1999 and for subsequent years. This will enable MEL to play a more integral role within GIPME and related marine environmental protection activities particularly the GPA.

89 **The Assembly was pleased to note** the progress to date in restructuring the GIPME Programme.

90 **The Assembly endorsed** the requirement contained in Document IOC-XX/2 Annex 3 that all three co-sponsoring agencies (UNEP, IMO, IOC) agree to the GIPME restructuring to ensure that their various interests are fully accommodated.

91 **The Assembly**, in its review, **stressed** the importance of health sensitive indicators for coastal applications, adoption of an interdisciplinary approach to the issue of eutrophication, and the requirement for GIPME to provide the scientific underpinning to the implementation of HOTO as specified in Resolution XIX-4.

92 **The Assembly further stressed** that there was a need to take into account the scientific requirements of regional marine protection activities, both those relevant to IOC and to other co-sponsoring agencies, including those stemming from regional and global agreements such as the GPA.

93 **The Assembly emphasized** the need to expedite the restructuring of GIPME and, to this end, prepare for the Thirty-third Session of the IOC Executive Council concrete steps to implement the new structure taking full account of regional interests.

3.4 OCEAN SCIENCE AND LIVING RESOURCES

General OSLR

94 The Senior Assistant Secretary for OSLR, Dr Ned Cyr, introduced the agenda item by referring to recent general OSLR activities as outlined in the IOC 1998 Annual Report and the Action Paper (Document IOC-XX/2).

95 He referred to IOC Executive Council Resolution EC-XXXI.2 which called for a Group of Experts to be convened to review the programme. Pursuant to this resolution, a meeting is planned for August 1999, and FAO, ICES, PICES, SCOR and SCOPE have been contacted regarding their participation and support.

96 Dr Cyr reported that the Living Marine Resources Panel of GOOS (LMR-GOOS) held its second meeting March 22-24, 1999 in Montpellier, France. The panel has begun development of a template of regional observations and products that are expected to become the foundation of the LMR-GOOS module. The next panel meeting is scheduled for December 1999 in Chile.

97 It was also noted that Phase I of the GCRMN South Asia node project, funded by the United Kingdom Department for International Development (DFID) was completed in 1998. Through this project, training was conducted in coral reef assessment and management, and national coral reef monitoring plans were developed for India, Sri Lanka and the Maldives. DFID has extended support for a second phase of this project, which will establish pilot monitoring programmes in the region beginning in 1999.

98 **The Assembly tanked** Dr George Grice, the outgoing Senior Assistant Executive Secretary for OSLR, for his work on behalf of the programme.

99 **The Assembly reaffirmed** its strong support for these general OSLR activities. **It was strongly recommended** that OSLR develop closer linkages with FAO.

Harmful Algal Blooms (HAB)

100 Dr H. Enevoldsen, Head of the IOC HAB Science and Communication Centre in Copenhagen, introduced the item and reported on intersessional HAB developments. The IOC Harmful Algal Bloom Programme has developed well under the guidance and initiative of the IOC Intergovernmental Panel on Harmful Algal Blooms (IPHAB). The Fourth Session of IPHAB was held in 1997. The Fifth Session was scheduled to occur prior to this Assembly, but following the suggestion of the IPHAB Chairperson has been postponed until November 1999.

101 On behalf of the Chair of IPHAB, Dr A. Zingone (Italy), Dr Enevoldsen reported that the majority of the resolutions and recommendations of the fourth session of the Panel had been implemented. He focussed on two major issues of concern: the new science programme GEOHAB, and the future of one of the present mechanisms for implementing the training and capacity building part of the HAB Programme, the IOC Science and Communication Centres on Harmful Algae.

102 Dr P. Gentien (France), Chair of the Scientific Steering Committee for GEOHAB, recalled Resolution EC-XXXI.1 which: adopted GEOHAB as a new science programme of the IOC; instructed the Executive Secretary IOC and SCOR to prepare terms of reference for, and establish, a joint GEOHAB Scientific Steering Committee (SSC); and called for the IOC became a full partner of GEOHAB. GEOHAB is the joint IOC-SCOR science programme on the Global Ecology and Oceanography of Harmful Algal Blooms. It is a plan for co-ordinated scientific research and co-operation to develop international capabilities for assessment, prediction and mitigation of harmful algae. GEOHAB is a science programme within general framework provided by the IOC HAB Programme and builds on the results of both the SCOR/IOC Working Group on the Physiological Ecology of HAB and the ICES-IOC Working Group on the Dynamics of HAB;

103 The scientific goal of GEOHAB is to determine ecological and oceanographic mechanisms underlying the population dynamics of harmful algae, by the integration of biological and ecological studies with chemical and physical oceanography, supported by improved observation systems. Improved global observation systems will be required to resolve influences of environmental factors (anthropogenic and climate-related) on distributions and trends in HAB occurrence. Links are growing between GEOHAB and GOOS.

104 IOC and SCOR have jointly appointed Dr Gentien, IFREMER (France) as Chair, Dr Yasuwo Fukuyo, University of Tokyo (Japan) as Vice-Chair, and a committee composed of 17 members. The IOC and SCOR secretariats are now working with the SSC to identify the resources to establish a GEOHAB Secretariat to develop and implement the programme. Funding for the operation of GEOHAB and the SSC in 1999, is secured through an ICSU grant as well as IOC, SCOR , and U.S. NOAA support.

105 Dr Enevoldsen also addressed the training and capacity building element of the HAB Programme. In order to have a stable mechanism for implementing HAB training and capacity building, the IOC, in accordance with Resolution XVII.2, established IOC Science and Communication Centres on Harmful Algae at the University of Copenhagen, and at the Spanish Institute of Oceanography in Vigo. The Centres are co-financed by the governments of Denmark and Spain respectively.

106 The Centre in Vigo is providing training and capacity building in particular to IOC Member States in Latin-America, and, very importantly, assists the IOC Secretariat in servicing the regional IOC HAB groups in South-America (FANSA) and in the Caribbean (ANCA). The Centre in Copenhagen, together with the IOC Secretariat, is charged with the general co-ordination of the HAB Programme and the implementation of IOC HAB training activities, The Centre has also devoted time and resources to support the development of GEOHAB, and is currently conducting co-operative research with marine research institutions in the IOCINCWIO and Caribbean regions and Viet Nam. From 1995-1999, more than 250 scientists, technicians, and trainers have been trained in identification, biology, and monitoring of harmful microalgae at courses implemented by the Centres.

107 The Centre in Vigo is funded until the end of 2001, whereas the original 5-year agreement with Denmark for the Centre in Copenhagen expires at the end of 1999. The Secretariat has therefore presented DANIDA with a proposal to support the Centre for 2000-2001. This has been approved within the US$4 million *per* year Framework Agreement between UNESCO and DANIDA. In addition to the approx. US$1.3 million provided by DANIDA over the last five years, the establishment of the Centre has allowed the IOC to attract an additional US$1 million for the

implementation of IOC HAB activities and to support for HAB co-operative research in IOC Member States.

108 **The Assembly noted** that it is very positive to see that in practice it is possible to have fruitful co-operation between a national scientific agency, a UN organization with its international network, and a donor. **It was also noted** that the implementation and success of the training and capacity building part of the IOC HAB Programme depends heavily on the support provided by Denmark and Spain for the Centres, and also by Japan to WESTPAC/HAB through the University of Tokyo. **The Assembly expressed** thanks to these countries for their continuous support.

109 **The Assembly reaffirmed its commitment** to the development of the HAB Programme as a priority activity of the IOC. Several Member States expressed their explicit interest in taking active part of GEOHAB. France reconfirmed its willingness to host and provide partial funding for an international project office for GEOHAB in Brest, and hoped it would be possible to open the project office by January 2000. The USA informed the Assembly that they are actively investigating possibilities for supporting the establishment and operation of an international GEOHAB project office in Brest. **The Assembly urged** other Member States and agencies to contribute to the operation of a project office for GEOHAB. It was stressed that GEOHAB should interact with GOOS and GLOBEC. The Representative of ICES drew the attention to the importance of the ICES-IOC Working Group on the Dynamics of Harmful Algal Blooms to the development of GEOHAB and expressed the wish of ICES to continue the joint Working Group as a complementary activity to GEOHAB. He also strongly encouraged IOC Member States outside the ICES area (North Atlantic) to participate in the work of the Working Group in order to give some real content to its joint sponsorship.

110 **The Assembly stressed** the importance of the training and capacity building element of the IOC HAB Programme, and urged the IOC to maintain and reinforce its activities both through the existing global activities such as the IOC Science and Communication Centres and through strengthening of regional activities. In particular IOCARIBE Member States requested that regional HAB activities be strengthened. Japan and Spain reconfirmed their commitment to provide support to the training and capacity building part of the HAB Programme through WESTPAC/HAB and the Science and Communication Centre in Vigo, respectively.

111 **The Assembly adopted** Resolution XX-3.

Global Coral Reef Monitoring Network (GCRMN)

112 The Global Coral Reef Monitoring Network Co-ordinator, Dr Clive Wilkinson, introduced the network with a short video illustrating the problems facing coral reefs, particularly highlighting the ability of reefs to recover from stresses once they are removed. The Global Coral Reef Monitoring Network has made considerable progress in developing regional monitoring activities, and published its first global status report in 1998. The programme is now to produce an updated and improved report as a major GOOS product in late 2000. **The Assembly requested** that all IOC Member States with coral reefs, and those supporting them through assistance projects, produce national status of coral reef reports by June 2000.

113 Several Member States requested assistance to develop better reef monitoring capacity, particularly in the wider Caribbean. Member States highlighted the specific problems of coral bleaching, crown of thorns starfish and sediment damage to their reefs, and requested assistance from the GCRMN to assess and mitigate these stresses. **The Assembly noted** with satisfaction the

significant progress in establishing the GCRMN and, in view of the 1997-98 widespread coral bleaching, confirmed the importance of IOC leadership of the GCRMN. **The Assembly requested** IOC regional bodies to increase co-operation with UNEP Regional Seas Programmes, UN agencies, and others to create an integrated regional approach to achieving the network's objectives. **The Assembly instructed** the Executive Secretary IOC to continue work with UNEP, ICSU, the World Bank, and the International Coral Reef Initiative partners to seek funding for the implementation of the GCRMN at global and regional scales and to institute financial and administrative mechanisms to facilitate rapid and efficient transfer of funds for GCRMN support. **The Assembly also instructed** the Executive Secretary IOC to carry out an assesment of the IOC's experience to date in implementation of the GCRMN.

114 The Executive Secretary IOC pointed out that after two decades of progress in studying major physical and bio-geochemical processes in the ocean, ocean science is undergoing a major conceptual evolution and it is now feasible to undertake important interdisciplinary studies that were previously intractable. He also acknowledged that the IOC: (i) has a key role in initiating, promoting and co-ordinating global ocean science; and (ii) has the responsibility to ensure that these scientific efforts are supplied with a necessary intergovernmental dimension so that emerging research issues, developments and scientific results are properly assessed and transmitted to Member States. Therefore, the IOC science programme structure should more closely reflect the new interdisciplinary nature of ocean science.

115 **The Assembly requested** the Executive Secretary IOC to initiate a review of the structure of the entire IOC science programme and to form an *ad hoc* group of appropriate experts to (i) review the framework of the existing ocean sciences programmes of the IOC in the light of new developments and requirements in ocean science; (ii) identify a new paradigm or new approaches for the IOC to meet the evolving aspects of interdisciplinary ocean science, in the context of bringing benefits to the Member States; and (iii) report to the Member States by the Thirty-third Session of the IOC Executive Council. **The Assembly recognized** that this decision would have a financial implication of US$15,000 from the Regular Budget allocation. **The Assembly further requested** the Executive Secretary IOC to approach SCOR and all other relevant partners to support and participate in this effort.

4. OCEAN SERVICES

4.1 DATA AND MARINE INFORMATION EXCHANGE

116 Mr Ben Searle, Chairman of the IOC Committee on IODE, introduced this agenda item. In his presentation, Mr Searle addressed the future challenges of IODE in a rapidly changing world, and expressed his view on the key areas which IODE should build on: (i) the use of the Internet and its associated technologies; (ii) data management and data exchange standards; and (iii) strategic alliances.

117 He stated that the task of the IODE data manager has become more difficult due to (i) the increasing volumes of data and their increasing complexity; (ii) the need to develop regional and global databases; (iii) the need to integrate different data types to create multidisciplinary data sets; (iv) the complex data and information requirements to support sovereignty claims under UNCLOS; and (v) the data management issues associated with operational oceanography.

118 Mr Searle also highlighted the significance of data management activities within marine programmes, and suggested that these activities needed to be given a greater visibility.

119 One of the most successful activities of the IODE has been the Global Ocean Data Archaeology and Rescue (GODAR) project. Through the efforts of GODAR almost 3 million historical temperature observations have been added to the World Ocean Database. The first phase of GODAR is being concluded with the Global GODAR Review Conference to take place in Silver Spring, USA between 12 and 15 July 1999.

120 The Global Temperature and Salinity Profile Programme (GTSPP), developed in co-operation with the IOC/WMO Integrated Global Ocean Services System (IGOSS) was identified as another area of success. GTSPP has demonstrated the concept of end-to-end data management, bringing together the near real-time operational community of IGOSS, and the delayed mode data management community of IODE. GTSPP serves as a model for data management within GOOS and GCOS and is widely recognized as an innovative and highly successful data management programme, effectively utilizing the skills and capacities of the IODE system.

121 With regard to regional IODE activities, special reference was made to the Regional Co-operation in Scientific Information Exchange (RECOSCIX) networks in the IOCINCWIO and IOCEA regions, focussing on marine information management and dissemination, and to the Ocean Data and Information Network for Africa (ODINAFRICA) which intends to develop oceanographic data (and information) management capabilities in Africa, through a combination of training, provision of equipment and financial support to enable the creation and operation of national oceanographic data centres or designated national agencies. In this regard, **the Assembly expressed** its gratitude to the many countries and international organizations that contribute to the IODE system.

122 IODE's Marine Information Management (MIM) component has also made considerable progress. The development of the Global Directory of Marine (and Freshwater) Professionals (GLODIR), and of standards for marine libraries and information centres are two important initiatives. The IOC is also continuing its participation as a UN Partner in the Aquatic Sciences and Fisheries Abstracts (ASFA) and sponsors ASFA CD-ROM subscriptions to a number of African Member States. The MEDI Pilot Project, a co-operative venture between the IODE data and information communities, has resulted in the development of a specific and user-friendly software for the creation of meta-data records in a standard format, ensuring compatibility or convertibility with the emerging ISO standard for meta-data and other major national standards.

123 The IODE Chairman welcomed the development of the Global Ocean Observing System (GOOS) and other global observing systems, which creates new challenges for IODE. However, he expressed his concern over the gradual merging and possible overlapping of the GOOS and IODE target data streams (and activities). The recently created Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology (JCOMM) will also cover data management issues. Without active co-ordination, this may lead to wasteful overlaps between these programmes and to under-utilization of the substantial IODE know-how and facilities.

124 **The Assembly expressed** its gratitude to the IODE Chairman for presenting his thoughts on policies and priorities for future IODE development. **It also urged** that IODE and JCOMM work together to address data management and to avoid wasteful overlaps and duplicated responsabilities.

125 **The Assembly reiterated** strongly the importance of IODE as one of the most important and cornerstone programmes of the IOC and **expressed satisfaction** with the efforts made by the IOC in facilitating regional programme implementation, particularly by further developing and implementing regional data and information management networks such as RECOSCIX-WIO, RECOSCIX-CEA, ODINEA and ODINAFRICA. **The Assembly called on** the IOC Member States to continue and step up provision of financial as well as in-kind support for the implementation of the programme.

126 **The Assembly requested** the Member States to further strengthen the system at the regional level so as to ensure that IODE is fully included in regional ocean programmes and projects. In this regard, **the Assembly noted** with appreciation the announcement of the International Conference on Oceanographic Data and Information Exchange in the Western Pacific (IODE-WESTPAC), which will take place in Langkawi, Malaysia, between 1 and 4 November 1999.

127 **The Assembly identified** the issue of the 'data use ethics' and data policy as extremely important for the successful implementation of the IOC activities. **The Assembly called on** the IOC to study this matter and collate information on existing standards, agreements and policies for ocean data collection, management and exchange.

128 **The Assembly stressed** the need to involve IODE in appropriate IOC programmes as a technical authority in programme planning and operation so as to avoid duplication of efforts and to make use of the considerable know-how available in the IODE community. For instance, IODE and GOOS should be mutually supporting and complementing each other.

129 **The Assembly identified** the need to further develop international partnerships in data management and for IODE to take a lead role in this.

130 **The Assembly identified** the need for IODE to regularly assess the data centres with regard to their sustainability and level of activity.

131 **The Assembly urged** IODE to ensure a balance between data and information management in its programmes and activities, and to broaden its focus to support policy, economic, social and legal areas.

132 **The Assembly urged** IODE to continue its efforts in the development of standards **and called for** this to be undertaken in close collaboration with the scientific communities. It was proposed that the IODE Chairman be included as a member of the IOC Data Policy Committee suggested by I-GOOS.

133 **The Assembly identified** the need for IODE to ensure the accessibility of data and information by a wide audience including the general public and the private sector in formats appropriate for them. In this regard, the application of new technologies such as the Internet (and Internet technology) as well as CD-ROM for the dissemination of data and information products was noted.

134 **The Assembly expressed its concern** about the IODE staffing situation at the Secretariat and called on Member States and the Executive Secretary IOC to ensure appropriate staff support.

135 **The Assembly adopted** Resolution XX-4.

4.2 OCEAN MAPPING

136 The item was introduced by the Chairman of CGOM, Dr Günter Giermann, referring to Document IOC/INF-1122, *Report of the IOC Consultative Group on Ocean Mapping to the Twentieth Session of the Assembly*. He informed the Assembly about the progress made in compiling and printing the International Bathymetric Charts (IBC). Many of these charts have been digitized, and the data included in the GEBCO Digital Atlas.

137 He referred to two items which were of particular interest to the Consultative Group at its 7th Session in Monaco: a concept for a selected number of local large-scale charts to help the developing countries in the exploration - but also the preservation of the marine environment - of their EEZs; and related TEMA and capacity building activities. He also drew attention to the close co-operation with the International Hydrographic Organization (IHO), and more recently with the International Arctic Sciences Committee (IASC).

138 Before the floor was open for discussion, the Head of the German Delegation, Prof. Peter Ehlers, handed over the first sheet of the International Bathymetric Chart of the Western Indian Ocean (IBCWIO) which had been printed in his agency, the "Bundesamt für Seeschiffahrt und Hydrographie" (BSH), in Hamburg with the assistance of Prof. Werner Bettac, Chief Editor of IBCWIO. The Head of the French Delegation, Mr F. Gerard handed over the first sheet of the IBCEA, which has been printed by the “Service Hydrographique et Océanographique de la Marine”. **The Assembly thanked** Germany and France for their outstanding commitment.

139 In the following discussion, there was a general feeling that progress had been made, and that the finalization of the remaining sheets for the six IBC regions should be accelerated. **The Assembly appreciated** the idea to develop - in the future - large-scale charts to help Member States in coastal development including tourism, mineral resources research and prospecting, artisanal fisheries, archaeology, and also tsunami forecasting. It became clear that such charts should not be used to establish the outer limits of EEZs.

140 Developing Member States requested assistance under TEMA to allow them to get more directly involved in the establishment of such charts. The Delegate of Nigeria expressed the wish for developing countries to receive training in digitization, and favoured the idea to establish a geological/geophysical Atlas.

141 The Delegates of Argentina, Brazil and Chile reminded the Assembly that activities within EEZs concern national jurisdiction, and that formal permission was required for foreign research vessels working on the EEZs of coastal States. The Representative of SOPAC said that the Pacific Small Island States would be pleased to see charting exercises starting soon in their vast EEZ. He invited Member States whose research vessels pass their zones to make sure that soundings made in the zones are handed over to the Pacific States on a regular basis.

142 The Delegates of China and Viet Nam requested the Executive Secretary IOC to make sure that the next session of the IBCWP Editorial Board takes place without further delay early next year. The Delegate of China invited the Board to meet in China.

143 The Delegate of Mauritius felt also that the IBCWIO Editorial Board should meet as soon as possible, and that until then, compilation of all charts should be completed.

144 The Delegate of Mexico said that IBCCA has highest priority in his country.

145 The Delegate of Greece hoped that the second edition of IBCM would be prepared soon.

146 The Delegate of the Russian Federation expressed the willingness of his country to further support Ocean Mapping activities, including those related to the World Ocean Atlas development as a part of the UN Atlas. He then, presented the Executive Secretary IOC with a CD-ROM containing an English version of the publication *Man and the Ocean*.

147 **The Assembly encouraged** data holders to permit the selective use of their data for mapping purposes.

148 **The Assembly appreciated** the progress made in Ocean Mapping and welcomed the new initiative to establish large-scale charts for the exploration of EEZ, and related TEMA activities.

149 **The Assembly thanked** all Member States who co-operated in Ocean Mapping exercises and groups, and who provided in particular, essential support to the programme, such as France, Germany, Russian Federation, United Kingdom and USA.

150 **The Assembly adopted** Resolution XX-5.

4.3 IDNDR-RELATED ACTIVITIES: STORM SURGES, EL NIÑO

151 The Deputy Executive Secretary IOC, Dr Iouri Oliounine, introduced this item.

152 IOC has responded to the objectives of the International Decade for Natural Disaster Reduction (IDNDR) in many different ways, especially in the area of tsunamis, storm surges and El Niño by creating and improving early warning systems, developing capacity building efforts and providing expert knowledge.

153 He focussed the attention of the Assembly on the actions taken by the Executive Secretary IOC and the Chairman of the IOCINDIO Regional Committee in implementing a joint IOC-WMO-UNESCO/International Hydrological Programme (IHP) project proposal on storm surges in the Northern Part of the Indian Ocean, and on IOC participation in the El Niño warnings efforts.[1]

154 The regional meeting on the storm surges will be held in New Delhi, India in conjunction with the IOCINDIO Workshop on Storm Surges under the auspices of the Indian Institute of Technology from 20-26 October 1999. The main objective of the regional meeting will be to develop a plan of actions and identify ways for receiving support in funds and in-kind from funding agencies, Member States and international organizations. The results of the regional meeting are planned to be reported to the IOC Executive Council and to the governing bodies of other organizations concerned.

155 The IOC is a member of the Inter-Agency Task Force on El Niño and IOC experts took part in a number of meetings in 1998 and 1999 which considered the scientific and technical needs for improving the precision of future El Niño warnings, through modelling and data assimilation, and through adapting warning messages to the needs and possibilities for action of the people addressed.

[1] The implementation of the tsunami programme was presented in very general terms, as it was thoroughly discussed by the Thirty-first Session of the IOC Executive Council in November 1998, which adopted Resolution EC-XXXI.3.

156 The decision of the UNESCO Executive Board taken at its 156th Session in May-June 1999 regarding mitigating the effects of the El Niño phenomenon was noted with satisfaction.

157 Dr Oliounine presented to the Assembly the address by Mr Philippe Boulle, Director of the IDNDR Secretariat, in which it was stated that "*the IOC has proved to be an effective support of the global disaster reduction effort of IDNDR*".

158 Delegates informed the Assembly about different national initiatives in developing infrastructures necessary for natural disaster studies, improvement of warning facilities and capacity building efforts.

159 The Delegate of Japan requested the ICG-ITSU at its session to be held in Seoul, Republic of Korea, in October 1999, to pay special attention to the mitigation and study of tsunamis generated by small magnitude earthquakes and underwater landslides. He suggested that the global monitoring of coastal geo-structural changes could be an objective of an extended GOOS.

160 **The Assembly expressed** satisfaction with progress in implementing the IDNDR-related activities and agreed that the experience gained during the decade should be widely used for the organization of natural disasters preventive measures.

161 **The Assembly agreed** with the message that international organizations should strengthen their interdisciplinary co-operation in disaster prevention and mitigation should be brought to the attention of the IDNDR Programme Forum to take place in Geneva from 5-9 July 1999.

162 **The Assembly invited** the Executive Secretary IOC to consider ways of transforming the past approach of disaster relief into disaster warning.

163 **The Assembly supported** the view expressed by the IDNDR Regional Meetings that the United Nations system should ensure the continuation of the function of co-ordination of natural disaster mitigation activities at the international level.

164 **The Assembly re-emphasized** the importance of the programme and requested the Executive Secretary IOC to increase staff and funding resources needed for a successful implementation of the programme.

165 The Representative of the International Ocean Institute (IOI) drew the attention of the Assembly to the need to implement jointly with ICAM a study on risks identification and assessment.

5. OPERATIONAL OBSERVING SYSTEM

5.1 GOOS

166 This item was introduced by the Chairman of I-GOOS, Dr Angus McEwan. He reminded delegates that GOOS is a substantial programme, and that there are several documents as background to the report on GOOS. Dr McEwan noted that the range of GOOS activities was too broad for him to review them in detail, but could be seen on the GOOS Web page at http://ioc.unesco.org/goos.

167 The key document for the presentation was the Report of the Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, (Executive Summary, IOC-WMO-UNEP/I-GOOS-IV/3s), which took place on June 23-25, 1999 in Paris. Several draft resolutions, based on the recommendations of I-GOOS-IV are attached to the Report, for consideration by the Assembly.

168 Dr McEwan then turned to the Report of the Working Group on GOOS Funding (Document IOC-XX/2 Annex 6), that was formed in response to Resolution EC-XXXI.10 following the Thirty-first Session of the Executive Council, and which he chaired. In view of the ever expanding programme of the GOOS Project Office, and the static level of core programme funding, GOOS development increasingly depends on extra-budgetary funding. The Working Group reported that most of the projected expansion in the current biennium is for regional activities, for which the GPO has succeeded in gaining extra-budgetary resources. For the near future, it recommended that IOC Regular Programme and general Trust Fund contributions to GOOS (excluding extra-budgetary resources obtained in response to proposals to outside agencies), be not permitted to fall below US$300,000 *per* year in the coming biennium, and it suggested some new approaches including the creation of a Resources Board or Panel to gain a broader base of extra-budgetary support for GOOS. The GPO is to be congratulated for more than doubling the IOC contribution to GOOS from extra-budgetary sources. **The Assembly welcomed** the report and **accepted** the recommendation regarding core funding for this major flagship programme.

169 GOOS is being incorporated into the Integrated Global Observing Strategy (IGOS), which is explained in agenda item 9. The arrival of global co-ordination of observations marks the development of a new paradigm for the use and application of science in which 'ownership' of data and information can be subordinated to the collective benefit of society. **The Assembly strongly supported** the participation of IOC in the IGOS Partners Forum as recommended by the Thirty-first Executive Council in Resolution EC-XXXI.8.

170 In the intersessional period, the focus has been applied on design for implementation by the new GOOS Steering Committee (GSC) which has convened twice (in Paris and recently in Beijing) under the leadership of Professor Worth Nowlin. Progress has been guided by some landmark publications, notably of *The GOOS Strategy and Principles* (Document IOC/INF-1091) and *The GOOS 1998 Prospectus* (Document GOOS Report 42), which contains a wealth of information for the guidance of intending participants including scientific and technical rationale, examples of observing system development in progress, the assessment of value and the necessities for building capacity.

171 The vehicles for the development of implementation designs are the GOOS advisory panels for the four GOOS Modules: Climate, Coastal, Living Marine Resources (LMR), and Health of the Ocean (HOTO). The fifth Module, Services, has been incorporated within the frameworks for implementation.

172 A conference on the observations needed to implement the Climate Module has been organized in concert with the WCRP, in October, to further guide and refine the requirements for ocean observations for climate. I-GOOS endorses co-sponsorship of this conference by IOC.

173 The Global Ocean Data Assimilation Experiment (GODAE) is now being developed to test the fundamental feasibility of GOOS. If it is demonstrated that assimilated data can be delivered in near real-time suitable for operational purposes, the major premises on which GOOS are founded

receive confirmation and it will be possible to advance the development of useful data products to further ensure its sponsorship from a host of users.

174 Critical to the success of GODAE is the concurrent accumulation of global ocean sub-surface physical data to complement that from satellites and surface observations, through the Argo Pilot Project. I-GOOS gave GODAE and Argo its strongest endorsement.

175 The Representative of the International Maritime Organization (IMO) noted that because the Argo project is in progress there is no time for the development of a legally binding instrument covering maritime safety issues (including Argo floats themselves), which are within the terms of reference of the IMO. If the IOC Assembly wishes, it can authorize the Secretariat to contact IMO with a view to possible development of an IMO Assembly (or Maritime Safety Committee) resolution dealing with the above-mentioned aspects.

176 GOOS is also being taken forward through regional pilot projects serving specific purposes, like the Tropical Atmosphere Ocean (TAO) array of buoys in the equatorial Pacific, and the Pilot Research Array in the Tropical Atlantic (PIRATA). Regional GOOS programmes seem to provide a very useful mechanism for engaging Member States in the development and implementation of GOOS. Regional developments are now involving a great many of IOC's Member States in GOOS, for instance with the recent creation of bodies like MedGOOS, PacificGOOS and IOCARIBE-GOOS. It was noted that MedGOOS Memorandum of Understanding was signed in Rome in March 1999. The Delegate of Portugal suggested that regional components should be formally approved by I-GOOS following evaluation.

177 The Delegate of Australia noted that the Government of Western Australia and the Australian Bureau of Meteorology were providing the infrastructure to establish a regional IOC programme office in Perth, Western Australia, as a focus for developing GOOS in the region and building the capacity of Member States to participate in and benefit from it.

178 To give strength to the development and implementation of GOOS, it is important that the concept and principles on which it is founded be widely recognized by governments.

179 **The Assembly adopted** Resolution XX-7.

180 Dr McEwan displayed a chart showing the current structure of GOOS, explaining that recognizing the growing scope of GOOS, the GOOS Steering Committee (GSC) has begun to examine the organizational structure of GOOS and has commissioned inter-sessional work on this topic. It is also taking steps to increase the representation of operational bodies in its membership.

181 He noted that reflecting the introduction of GSC as the prime planning body of GOOS, I-GOOS had reviewed its own terms of reference and proposed changes to the Assembly.

182 **The Assembly adopted** Resolution XX-8 containing the revised Terms of Reference for I-GOOS.

183 The call for balanced development of GOOS at the IOC Executive Council in November 1998 indicated widespread interest in and support for Coastal GOOS, reflecting the considerable interest of Member States in their coastal seas. In response to this support, a Coastal Module Panel (C-GOOS) has been established under Dr Tom Malone's chairmanship and has met three times with a fourth meeting in China scheduled in October. C-GOOS is cultivating links with the LOICZ

Programme of IGBP and the UNEP Regional Seas Programme. A consultant is being engaged to prepare a global inventory of coastal monitoring systems in partnership with LOICZ. In addition, a LMR panel has been formed and has met twice, with a third meeting proposed later this year in Chile.

184 Holding these panel meetings in the regions provides an opportunity to consult local people about their user requirements, which can then be taken aboard in the GOOS design.

185 With the appointment of Dr Tony Knap as Chair, the HOTO panel will further advance its design for implementation. As with C-GOOS, linkages are being established with other programmes.

186 The GSC is exploring the possible merging of the plans of the C-GOOS, LMR and HOTO Module Panels, which will be addressed at a meeting in fall 2000.

187 Although the modules are clearly at different stages in their definition, Dr McEwan noted that we are much closer than we have previously been to the 'balanced development' of GOOS in the interests of the Member States. The balance will improve as the various panels complete their implementation design strategies next year.

188 A GOOS Initial Observing System (GOOS-IOS) has been defined from a number of existing observing systems, as a means of demonstrating that GOOS is starting from a finite base. I-GOOS, in recognizing its value, noted that a mechanism was needed for accepting systems as additions to the IOS and in due course for formal approval of the GOOS so defined.

189 In a discussion of the implementation of specific programme elements, I-GOOS noted the problem of vandalism of moored arrays and lends its support to the IOC Executive Council Resolution EC-XXXI.4 on the subject.

190 With the pace at which new regional groupings and activities in the name of GOOS are being proposed, some caution has been expressed at the guiding definitions for such groupings. It needs to be emphasized that regional alliances and national ocean observing co-ordination bodies have a valuable role to play in ensuring satisfactory linkages with and between such initiatives. In this context I-GOOS drafted a Resolution concerning the IOC co-sponsorship of a steering group for GOOS of the International Council for the Exploration of the Sea (ICES).

191 **The Assembly adopted** Resolution XX-9.

192 The need to include activities to raise the capacity to participate in GOOS, especially in areas with disadvantages of geography and lack of focus, is acknowledged throughout GOOS planning. Three capacity building workshops have been convened in the inter-sessional period, and three specific training workshops. A Capacity Building Strategy is under active development by the GSC, and five further workshops are scheduled for 2000, depending on external sponsorship. Two of these will be held in the Mediterranean to help build MedGOOS; one will be held in Nouméa (New Caledonia) to help build PacificGOOS; and two are planned one each in south America and Africa. There will also be at least two technical training sessions. The IOC is also proposing to aid the development of GOOS, including the building of capacity, in the Australasian region.

193 The Delegate of Peru invited the Executive Secretary IOC to examine the experience gained within the framework of the joint IOC-WMO-CPPS Working Group, which has been working very

productively for some time on greater scientific understanding of the ocean-atmosphere interaction in the South-East Pacific.

194 Noting that, the Permanent Commission for the South Pacific (CPPS) could be a useful vehicle for GOOS capacity building, **the Assembly endorsed** Resolution XX-10 with a proposal of a special arrangement between IOC and CPPS. The Executive Secretary IOC **was requested** to invite the CPPS to participate in the arrangement proposed in the Resolution.

195 **The Assembly noted** that National GOOS Co-ordinating Committees might be better described as mechanisms, and that the ocean data exchange question should be considered in the framework of the IODE. With the goal of ensuring consistent data policies between the global observing systems and noting the counter-trend toward ownership of databases, **the Assembly adopted** Resolution XX-11, proposing an *ad hoc* Intersessional Working Group on Oceanographic Data Exchange Policy.

196 During the discussion, many delegations gave brief accounts of their own GOOS activities at the national level, which include the formation of national GOOS co-ordinating bodies involving a wider range of stakeholders. Finland introduced delegations to the ALGALINE system which is a highly cost-effective, reliable, automatic system for gathering marine environmental data from ships-of-opportunity such as ferries, and which could be used elsewhere for GOOS operations. Several delegations agreed that JCOMM was essential for GOOS development.

197 To guide the GOOS administration in its implementation actions, a non-governmental meeting took place in Paris in parallel with the IOC Assembly on July 5 and 6, 1999. At this Initial GOOS Commitments Meeting, hosted by IOC, marine agencies and national bodies and organizations were invited to declare their national contributions to GOOS as another means of ensuring the growth of GOOS. This meeting had been called for by I-GOOS-III and GSC-I, and endorsed by I-GOOS-IV. Dr McEwan, who chaired the Commitments Meeting, reported that the meeting had been attended by representatives from 21 countries and 5 organizations, and that there were presentations from 17 nations and 3 organizations. A great many commitments had been identified, and these were offered as an Annex IV. to the report of the IOC Assembly. The proceedings of the meeting and the texts describing the commitments will be published as an IOC/GOOS report. Dr McEwan interpreted the enthusiastic offer of these commitments as evidence of the widespread interest in GOOS by Member States. He expects further commitments to be offered as clearer definitions emerge of the components of GOOS that interest most Member States. He reminded delegates that what was required was commitment of existing observing activities, or subsets of such activities, provided that they were consistent with GOOS Principles. A process now needs to be developed to refine the description of the commitments, and to review them against the GOOS Principles. In future, the Commitments Meetings should be made part of the I-GOOS meetings.

198 **The Assembly endorsed** the following recommendations that emerged from the deliberations of the Meeting:

(i) the IOC should encourage countries to establish mechanisms for national co-ordination of operational activities consistent with GOOS;

(ii) the Assembly should provide strong support to: (a) an intersessional IOC Working Group on data policy; (b) the GODAE and Argo pilot projects; and (c) the establishment of JCOMM.

199 **The Assembly was pleased** with the progress made in obtaining concrete commitments to GOOS from Member States, noting that there would be a need for further Commitments Meetings in the future as a means of building the total global GOOS. **The Assembly agreed** with the need for a process to bring commitments into GOOS in a way that ensures they are consistent with GOOS Principles, **and decided** to include the list of Initial Commitments as an Annex to the Assembly report. **The Assembly noted** the apparent paradox that GOOS is being developed in accordance with a scientifically designed plan, yet the managers of GOOS are building it initially from existing systems not originally designed to that plan. It was accepted that the implementation must be pragmatic, and that as designs are articulated the contributions of existing activities (like the Initial Commitments) will be evaluated against those designs and may need modification. Ideally, convergence will soon be seen between the contributions and the design.

200 The Delegate of Portugal suggested that further efforts, perhaps aided by Member States, were needed to ensure the proper balance of GOOS, that the pollution side should not be neglected, and that the role of C-GOOS needed clarifying.

201 The Delegate of Colombia requested the Executive Secretary IOC to facilitate the participation of the developing countries in GOOS by preparing a handbook indicating the minimum infrastructure required, the type and quality of the information to be provided and, through TEMA, to develop and carry out training programmes.

202 France suggested that, as well as the GSC having more operational people among its membership, consideration should be given to it having someone with extensive data and information management experience. France supported the notion of a Resource Board as proposed by the intersessional Working Group on GOOS Funding .

203 During the discussion on Argo, the Assembly did not see the need for a working group at this time to examine the possibility of developing a Convention to cover that activity of such PALACE floats. Several delegations expressed the view that Argo could not wait on the development of treaties, which might take a decade or more. Argo is needed now to improve seasonal and inter-annual forecasting for the benefit of the people of Member States. The Executive Secretary IOC reassured the Assembly that GOOS development will be entirely consistent with the provisions of UNCLOS. He noted that, through the Advisory Body on the Law of the Sea (ABE-LOS), the IOC can examine its programme developments in relation to UNCLOS, and should use this approach rather than work on a Convention to cover such developments as Argo.

204 **The Assembly appraised** the progress achieved by GOOS and noted that GOOS has now moved from a concept to an implementable reality, especially as far as open ocean observations in support of weather and climate forecasting are concerned. GOOS is now seen throughout the intergovernmental system as the prime vehicle for co-ordinated ocean observations. The vision of a truly global, integrated and fully comprehensive ocean observing system is still far from realisation, but the design of GOOS accommodates this vision. Although it will take decades to finalize, the first building blocks are now in place.

205 **The Assembly acknowledged** that much of the success of GOOS in the intersessional period was achieved due to the restructuring of the IOC Secretariat implemented by the Executive Secretary IOC and to the energy of the GOOS Project Office (GPO) under the direction of Dr Colin Summerhayes. **It welcomed also** the improving balance in GOOS development across the different modules.

5.2 GCOS

206 Dr Alan Thomas, the new Director of the Global Climate Observing System (GCOS), reported on this item, referring to the notes in the Action Paper (Document IOC-XX/2) and the GCOS Memorandum of Understanding which was signed by the sponsors, including IOC, in September 1998 (Document IOC-XX/Inf.1). While the MOU calls for a focus on implementation, he noted that implementation of a global observing system for climate needs implementation of several other global observing systems, among them GOOS, GTOS, the Global Observing System (GOS) of the World Weather Watch (WWW), the Global Atmosphere Watch (for chemistry), and the world hydrology cycle system. Happily, in the development of GCOS there is now a very close interaction between GOOS and GCOS, both at the level of their secretariats, and in their joint sponsorship of certain advisory panels: OOPC, the Joint Data and Information Management Panel (J-DIMP), and GOSSP (Global Observing Systems Space Panel). The ocean component of GCOS is the climate component of GOOS.

207 The most exciting recent development is the arrival of a new mandate for climate observations from the 4th Conference of the Parties to the Framework Convention on Climate Change (COP-4) which took place in Buenos Aires in November 1998. This deepens the awareness of governments of the global observing systems. The report by GCOS to COP-4 was made on behalf of the agencies participating in the Climate Agenda, including IOC, and was written with the aid of GOOS, especially the Chairman of the OOPC, Dr Neville Smith.

208 COP-4 called for an expansion of global ocean observations, and called on the GEF to provide resources to enable developing countries to develop observing systems. It also asked GCOS to advise COP-5 on the development of national plans to aid Parties to report on their observing activities in future.

209 GCOS fully supports the development of GODAE, Argo and JCOMM because it sees them as essential for a climate observing system.

210 One of the recommendations of COP-4 was that GCOS needs to have some guidance at the intergovernmental level. The GCOS Steering Committee is considering the development of an intergovernmental board with, say, 30 governments represented.

211 Like GOOS, GCOS is keen on advancing the development of a global observing system through regional initiatives with which small groups of Member States can easily identify. It is considering the development of regional workshops to take this forward.

212 WMO Congress unanimously endorsed GCOS and the development of national plans, and provided additional financial support for GCOS. The Congress urged Member States to assist in funding the GCOS Secretariat and its co-ordination activities.

213 **The Assembly welcomed** the co-operation between GOOS and GCOS and **noted** that it can only be good for the mutual development of these complementary systems.

214 The Executive Secretary IOC referred to the prospect of GEF funding and referred to the need to develop regional activities to support GCOS and GOOS. IOC itself does not have the resources Member States need for national or even regional development. It can act as a catalyst, but should not be seen as a funding agency. What is needed is a common strategy to identify, on behalf of Member States, where the resources are. GEF has a mandate to assist, but we need to

discuss in detail with the GEF how this might be done. Ultimately it is the Member States who have to approach the GEF for funding; the IOC is not eligible to do so, though it can help with the approach. He believes we can make significant progress to develop GOOS in Africa, but only if we do so in partnership with Member States. He reminded delegates that it commonly takes 18 months to develop a GEF proposal and get it funded.

215 Recognizing WMO Congress Resolution 7 (Cg-XIII) on GCOS, and the 1998 GCOS Memorandum of Understanding (Document IOC-XX/Inf.1) between WMO, IOC, UNEP, FAO and UNESCO, **the IOC Assembly reaffirmed** its intent to continue its support for the further planning, development and implementation of GCOS, especially through financial support of US$40,000 for the biennium to the operation of the GCOS Secretariat, **and urged Member States** to assist with the implementation of a global observing system for climate and with the building of capacity in developing countries to enable them to collect, exchange and use climate data to meet local, regional and global needs.

5.3 OPERATING SYSTEMS: IGOSS, GLOSS, DBCP, SATELLITES

5.3.1 Integrated Global Ocean Services System/Ship-of-Opportunity (IGOSS/SOOP)

216 The IOC-WMO Ship-of-Opportunity Implementation Panel (SOOP-IP) met in Nouméa, New Caledonia (26-30 October 1998). It is in the process of developing a Strategic Implementation Plan, which will indicate its role in servicing the needs of GOOS and GCOS. Most of the measurements concern sub-surface temperatures, but there are some measurements of surface and sub-surface salinity. The Co-ordinator for the programme will now be Mr Etienne Charpentier, who will also continue his work with the DBCP, as the Panel's Technical Co-ordinator.

217 Mr Yves Tréglos, Technical Assistant Secretary, reported that changes in the practices of shipping companies, in response to increasing competition and the drive for increased efficiency, meant that it has not been possible to maintain all the SOOP lines. Many lines are now under-sampled, although SOOP-IP is focusing on trying to meet the TOGA/WOCE recommendations. The proposed Argo project is clearly becoming increasingly desirable as a means of filling gaps in the collection of sub-surface data. Other requirements are improving co-ordination with the WMO's Voluntary Observing Ship (VOS) Programme, and persuading Navies to contribute their sub-surface data within the IGOSS time-frames.

218 The electronic IGOSS Products Bulletin (E-IPB) continued to develop, thanks to the activities of its editor, Dr Yves Tourre, the IGOSS Scientific Advisor. The E-IPB can be consulted from the front page of the IOC Web site or at the following direct URL: http://rainbow.ldeo.columbia.edu/igoss/productsbulletin. The E-IPB (in its present form, or slightly amended) will be considered, in future, as a GOOS product.

219 **The Assembly noted** that, in view of the impending merging of the Joint IOC-WMO Committee for the Integrated Global Ocean Services System (IGOSS) and the WMO Commission for Marine Meteorology (CMM), the activities of the former, namely, the Ship-of-Opportunity Programme (SOOP) and the electronic IGOSS Product Bulletin (E-IPB), would fall under the competence of the proposed Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology (JCOMM). **The Assembly commended** the work accomplished so far under those headings and **decided** to defer any discussion on the topic until a final decision was taken about JCOMM (see Section 5.4).

5.3.2 Global Sea-Level Observing System (GLOSS)

220 Dr T. Aarup, Technical Secretary of the IOC Group of Experts, presented to the Assembly the Report of the Sixth Session of the IOC Group of Experts on GLOSS, held in Toulouse, France, 10-14 May 1999 and the Recommendations of the Session for adoption.

221 The Session reviewed the progress in the GLOSS Implementation Plan since 1997 and prepared a List of Actions for the 1999-2001 period.

222 Impressive progress has been made: two thirds of the GLOSS Core Network stations appear to be fully operational; of the 287 sites in the Core Network, only 42 are claimed to be non-operational; 85 GLOSS stations report to the WOCE 'Fast Delivery' Data Acquisition Centre in Hawaii, with data usually available within one to two months of data collection. He noted that tide gauges equipped with GPS equipment as 'tide poles' for the on-going calibration of altimeters are increasingly valuable. A 'Manual' on how to operate GPS receivers will be produced before the end of the year, including a number of case studies. The need for real-time data, in regards to model data assimilation or altimeter calibration, but also for more efficient data gathering and quality control, was a special theme at the Group of Experts meeting. Special efforts will be made to arrange for all authorities to go 'real time' in the near future. He then referred to the two training courses implemented with the support of IOC, and to the publication of the GLOSS bulletin and the Afro-American GLOSS NEWS regularly on the Web.

223 Finally, Dr T. Aarup informed of the endorsement by the Group of the *ex-officio* right to membership of the Group of Experts (GE) by the representatives of appropriate bodies related to sea-level measurement issues. The discussion also took place on a proposal that a sub-group of the GE be formed as a source of scientific advice, especially on climate issues, jointly with the representation of OOPC, CLIVAR/UOP and IAPSO/CMSLT.

224 Many delegates expressed their strong support for and intention to continue active participation in the GLOSS activities. Many delegates gave information about their national activities related to GLOSS and its regional components. The delegates of several Mediterranean and Black Sea countries highlighted the importance of regional sea-level data for activities within MedGOOS and the Black Sea component of GOOS.

225 The Delegate of Mauritius expressed concern about lack of funding to continue the operation of two tide gauges initially installed as part of the TOGA project, which lasted from 1985-1992. The Delegate noted that GEF had supported a project to establish an extensive network of sea-level gauges in the Caribbean region and proposed that a similar project be initiated in the West Indian Ocean.

226 The Delegate of India mentioned that a tide gauge would be provided to Viet Nam. The Delegate stated that lack of manpower had so far delayed the analysis of vast quantity of analogue chart data. He expressed that India would try to make available arrays of data from Indian GLOSS stations to PSMSL within a period of about a year.

227 **The Assembly agreed** on the importance of immediate implementation of the pilot phase of MedGLOSS which is a joint programme of IOC and the International Commission for the Scientific Exploration of the Mediterranean Sea (ICSEM), following three years of preparatory activities. **The Assembly noted with thanks** an offer from Israel to host a co-ordination meeting of representatives from the countries that agreed to participate in the pilot phase and the willingness of

ICSEM to share the costs of the pilot phase co-ordination meeting. **The Assembly urged** the Executive Secretary IOC to enhance the IOC involvement in MedGLOSS and support the pilot phase co-ordination meeting.

228 **The Assembly approved** the Summary Report of the Sixth Session of the Group of Experts on GLOSS and **adopted** Recommendations contained therein.

229 **The Assembly supported** the proposal for a panel of experts to assist in the design of the global tide gauge network required to meet the climate objectives of GOOS and CLIVAR. It was suggested to include C-GOOS representatives in the proposed joint scientific steering group and that an integrated tide gauge network be designed to meet all GOOS requirements.

230 **The Assembly stressed** the need for the rescue of historical sea-level data in order to extend sea level-time series and suggested that such an initiative be started under the IODE programme in support of PSMSL activities.

5.3.3 Data Buoy Co-operation Panel (DBCP)

231 Mr Yves Tréglos reported that by the end of 1998 there were around 700 buoys distributing about 6,000 observations/day onto the Global Communication System (GTS). Most buoys equipped to measure Sea-Surface Temperature (SST), and about 250 measure air pressure and some wind sound. Thanks to improvement of numerical models and comparison of observed data with the first guess field implemented, e.g. European Centre for Medium Range Weather Forecasting (ECMWF), U.S. National Centres for Environmental Prediction (NCEP), Météo France, United Kingdom Meteorological Office (UKMO); it has been shown that the quality of drifting buoy data is excellent for SST, air pressure, and wind speed.

232 Since the establishment of the DBCP, co-operation has increased between meteorologists and oceanographers. This link is aided through use of the Surface Velocity Programme Barometer drifter (SVPB), developed under WOCE at Scripps Institution of Oceanography, and tested by a number of meteorological agencies.

233 The DBCP has a global coverage which is achieved through its section groups: the European Group on Ocean Stations (EGOS) for the North Atlantic; the International Arctic Buoy Programme (IABP); the International Programme for Antarctic Buoys (IPAB); the International South Atlantic Buoy Programme (ISABP); the International Buoy Programme for the Indian Ocean (IBPIO); the Global Drifter Programme (GDP); the Tropical Atmosphere Ocean-Implementation Panel (TAO-IP).

234 Météo France is producing for the DBCP the Data Availability Index Maps, which show for the four basic variables (air pressure, SST, wind speed and air temperature) how well the requirements of 8 observations *per* day for an area of 500 km by 500 km are met. These maps also show the percentage of buoy data compared to total ship plus buoy data which contribute to meet the displayed index value. These maps help to identify data sparse areas for given variables, and consequently aid in the adjustment of deployment plans.

235 The DBCP has completed an Implementation Plan and is defining its deployment strategy to optimize deployments according to defined WWW, GOOS and GCOS requirements. The DBCP Implementation Plan was integrated within the GOOS/GCOS action plan.

236 Several Member States reported on their contributions to the Panel's achievements. They further highlighted the close relationship between the Argo project, the DBCP undertakings and the SOOP activities: those three bodies/programmes are presently the core of operational oceanography as far as *in situ* measurements are concerned.

237 **The Assembly noted** the achievements of the Data Buoy Co-operation Panel (DBCP) so far and **commended** the Panel for its contribution to the development of the Implementation Action Plan for Global Ocean Observation to meet the requirements of GOOS and GCOS. **The Assembly** further **urged** Member States to consider contributing to funding the post of the Panel's Technical Co-ordinator, which is now combined with that of Operations Co-ordinator for the Ship-of-Opportunity Programme.

5.3.4 Satellites

238 The item was introduced by Dr Summerhayes, Head of the IOC Section on Operational Observing Systems (OOS). The IOC's main interest in remote-sensing from satellites lies in its interactions with CEOS. These are focussed primarily through the activities of the Global Observing Systems Space Panel (GOSSP) shared jointly with GCOS and GTOS. GOSSP now has new terms of reference and a new Chair: Dr Francis Bretherton. It met last at its Fourth Session, in October 1998, in Maryland, and holds its next meeting in Pasadena, California in August 1999.

239 GOSSP is a vehicle for feeding a co-ordinated view of GOOS requirements to the space agencies. It provides primary input to the Committee on Earth Observation Satellites (CEOS) on user requirements, and establishes clarity and transparency on needs and plans. Currently it is revisiting previous lists of requirements in the WMO database for consistency internally and with advisory panels.

240 GOSSP is also charged with working with the various advisory panels (like the OOPC) to identify major issues requiring decision or action. It has identified the immediate priority measurements from space, which include satellite altimetry (probably three altimeters as a minimum), sea-surface temperature (a case is emerging for two scatterometers), surface wind vectors, and ocean colour.

241 In 1998, the Chairman of IODE represented GOOS at the 7th meeting of CEOS's Working Group on Information Systems and Services (WGISS) in Kyoto, and Dr Ehrlich Desa (India) represented GOOS at the 12th CEOS Plenary in Bangalore, India.

242 In discussion the Delegate of India informed the Assembly that India had plans to launch a sequence of ocean related satellites. The Delegate of Ukraine noted that both countries were launching satellite systems for ocean measurement.

243 **The Assembly acknowledged** the very useful work that was effected *via* GOSSP providing co-ordination among different international programmes to clearly specify the technical demands of the global observing systems to the space agencies and the association with CEOS.

5.4 JCOMM

244 Dr Summerhayes, Head of the Operational Observing Systems (OOS) Section and Director of the GOOS Project Office (GPO), introduced this item, noting that background was available in Reference Document IOC/EC-XXXI/10, in the Report of the Thirty-first Session of the Executive

Council (section 4.3) and the associated Resolution EC-XXXI.13, and in the Action Paper (Document IOC-XX/2). He noted that at its recent meeting, I-GOOS-IV had endorsed the Draft Resolution regarding the creation of a Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM), seeing the new body as a much needed implementation infrastructure for GOOS, and which represents a major step forward in the global integration of operational global observations.

245 The process of searching for an overall co-ordination and management mechanism to implement GOOS/GCOS and a range of other operational oceanographic and marine meteorological activities began in 1996 when the IOC and WMO agreed on the need to facilitate closer co-operation in oceanography to streamline the approach to operational oceanography and existing mechanisms, and eventually jointly regulate and manage operational oceanographic systems. Consultants were engaged to consider the possibilities, and proposed the merger of the WMO's CMM (responsible for marine meteorology) with the joint IOC-WMO/IGOSS (responsible for upper ocean measurements, primarily physical), into a Joint Technical Commission for Oceanography and Marine Meteorology. At its Thirteenth Session in May 1999, the WMO Congress endorsed the recommendation of its Executive Council on the establishment of JCOMM jointly with IOC.

246 JCOMM's terms of reference are to: (i) further develop the observing networks; (ii) implement data management systems; (iii) deliver products and services; (iv) provide capacity building to Member States; and (v) assist in the documentation and management of the data in international systems.

247 The management paradigm for the late 1990's and the beginning of the new millennium is *Partnership*. JCOMM will be a partnership, with 50% of its members from meteorology and 50% from oceanography, and joint Chairs. Reporting to it will be specialist advisory panels, probably including in the first instance panels on (i) the ocean surface (e.g. Sea-Surface Temperature - SST) and marine meteorology; (ii) the upper ocean (temperature, salinity, carbon dioxide); and (iii) sea-level (e.g. Global Sea-level Observing System - GLOSS). JCOMM will be advised by GOOS bodies (GSC and I-GOOS), by GCOS and by the World Weather Watch (WWW) of the WMO, and IODE of IOC. In turn it will report to the sponsors: IOC and WMO. The IODE will not be within JCOMM but will be strongly linked to it.

248 Dr Summerhayes talked about the potential value of JCOMM to IOC and GOOS. The concept of JCOMM had arisen because increasingly oceanographers need meteorological data while meteorologists are increasingly interested in operational oceanography. Indeed, climate prediction depends on the ocean and climate modelling and requires oceanographers and meteorologists to work together with coupled ocean atmosphere models. Furthermore, both communities need to collect their data at the same time and place to determine the fluxes across the air-sea interface. It seems therefore sensible to envisage one voluntary observing ship programme for combined meteorological and ocean data, not two as at present (VOS and SOOP).

249 Being part of JCOMM offers the IOC access to the capacity building programme of the CMM, which should help IOC to meet more of the capacity building demands of Member States.

250 It makes sense to apply the JCOMM model of integration between atmosphere and ocean to other aspects of IOC data collection in the future, which is what GOOS envisages. In future there is the potential for specific technical sub-groups similar to those reporting to JCOMM to be formed to deal with different areas of GOOS data collection and management (e.g. pollution, living

resources). GOOS and JCOMM planning will address the broadening of the JCOMM remit as JCOMM and GOOS develop beyond addressing just the climate area for which we are most ready.

251 Dr Summerhayes referred to the discussions and the recommendation by I-GOOS-IV. I-GOOS-IV attendees were convinced that JCOMM would bring benefits at the national level by requiring improved co-ordination between oceanographic and meteorological institutions.

252 I-GOOS-IV had noted that, in developing JCOMM, there will be a need to preserve the balance between the different components of GOOS, though it was recognized that the non-climate elements are not yet ready for implementation. **The Assembly noted** that the development of JCOMM should recognize the broad requirements of the IOC and WMO. It should be reviewed after a few years to see that it is meeting IOC and WMO requirements.

253 Mr Robert Landis, of the WMO, presented the regrets of Dr Obasi, Secretary-General of the WMO, who was unable to attend the Assembly, and reported that the WMO had formally adopted JCOMM at its 13th Congress, with enthusiastic support from Members. Its endorsement also by the experts involved in planning global observing systems, sent a strong message too, as did its endorsement by the IOC Executive Council. He pointed out that as a Joint Technical Commission, JCOMM had required certain changes to the WMO General Regulations. These will be made contingent upon the IOC Assembly endorsing JCOMM.

254 Mr Landis said that JCOMM provides a clear and sensible option for meeting the requirements of GOOS and GCOS. Given the close and trusting relationship that has evolved between the Secretariats of IOC and WMO in recent years, he felt sure that the venture would work.

255 The Chairman IOC supported the remarks of Mr Landis regarding the evolution of co-operation and progressive increase of trust between the IOC and WMO, and the proven success of their present joint ventures. JCOMM may be taken as a model for developing partnerships with other agencies in relation to other programmes, such as UNEP, IMO and FAO, and in that context is a very important step that could portend a broader and more central role for the IOC.

256 Many Member States spoke in support of the proposal for the IOC and WMO to join forces in JCOMM, applauding the new spirit of co-operation between the two organizations. It was agreed that JCOMM was essential for GOOS development. JCOMM provides an appropriate pragmatic mechanism for the new era of global observations and will aid data exchange and quality control. It provides a more rational means through which to demonstrate GOOS' activities and objectives to governments and the public, and is a model for global trends towards greater integration. **The Assembly thanked** the scientists who had worked to prepare the proposal.

257 Several Member States noted the need for particular actions or considerations. For instance, the Russian Federation noted that in setting up JCOMM, it would be important to draft appropriate rules and procedures. The Delegate of Portugal noted that consideration needs to be given to (i) the notion of broadening the partnership of JCOMM, or for complementary groups to be formed, to handle a wide range of data types; (ii) the budgetary and structural implications to the IOC and to Member States; and (iii) the need to evaluate JCOMM after a few years to ensure that it is progressing in a satisfactory way, consistent with IOC requirements. Together with the Delegate of China, they requested that, at the appropriate time, JCOMM addresses the needs of other Modules of GOOS, not just the Climate Module.

258 **The Assembly agreed** that a lot of work will be needed in the future to see what mechanisms should be used to manage the data not presently addressed by the proposed JCOMM. It was stressed that mechanisms for handling ocean data will need to be modified as demands for real-time data increase, and observed that close co-operation should be established between IODE and JCOMM in this area.

259 Several Member States noted that, although many governments want to see this more effective approach across functional and sectoral boundaries, difficulties may be anticipated initially in making appropriate arrangements for JCOMM at the national level, given the common separation of oceanographers and meteorologists into different ministries. **The Assembly asked** that the IOC and WMO take this into consideration when informing governments about the new arrangements. **The Assembly accepted** that it will be a challenge to the Member States, to the IOC and WMO Secretariats, and to the Co-chairpersons to make JCOMM work.

260 **The Assembly thanked** Dr Dieter Kohnke for his long chairmanship of IGOSS, one of the bodies that would be merged into JCOMM.

261 In summarizing the debate, the Chairman IOC noted the unanimous support for the new venture, and asked the Executive Secretary IOC to convey the news back to Dr Obasi, WMO, and its Members. **The Assembly emphasized** that JCOMM's success, as in any marriage, will depend on the efforts of both partners to make it work, including those of the Secretariats and Member States. Questions of detail concerning the setting up of JCOMM will be addressed at the JCOMM transition meeting that will take place in St. Petersburg in July 1999. JCOMM will report to the governing bodies of the IOC and WMO, and in due course, its progress will be evaluated. Bringing together national structures in the way required to make JCOMM work is likely to be a painful and difficult process, but in the end we will be the better for it.

262 Regarding practical arrangements for JCOMM, **the Assembly agreed** with the WMO Congress that meetings of the new joint technical commission, including pre-session documentation and post-session report, will be funded by IOC and WMO in turn. Meetings of half of any working groups established will be funded by IOC and the other half by WMO in such a way that costs borne by each body are approximately equal, and Secretariat support will be provided jointly by IOC and WMO, along the lines of current arrangements for IGOSS. Bearing in mind the multidisciplinary and joint organizational nature of the new technical commission, **the Assembly further agreed** that the officers of JCOMM should comprise two co-presidents, who should be drawn one each from the oceanographic and meteorological sciences, with the primary responsibility for guiding the technical commission alternating from one intersessional period to the next.

263 In closure of the agenda item, the Executive Secretary IOC referred to a letter he had just received about JCOMM from the Honourable Simon Upton, Minister for the Environment of New Zealand, and Chairman of the UN CSD:

> *"I recognize very well that this initiative represents a significant undertaking on the part of both Organizations, involving a pooling of resources and expertise in response to a major global need. Furthermore, I believe that it is also very much in line with the view expressed a number of times during the recent seventh session of the UN Commission on Sustainable Development (New York, April 1999), on the need for UN agencies to work more closely together, and for better co-ordination amongst national interests, in addressing environmental issues of common concern.*

I would therefore like to take this opportunity to congratulate you and your Organization on this important initiative. I would hope that it provides a stimulus and model for similar developments elsewhere in the UN system."

264 **The Assembly agreed** that this was an eventful moment, worthy of reporting to the press, and asked the Secretariats of IOC and WMO to work together on a combined press release to be timed with the approval of the Resolution.

265 **The Assembly adopted** Resolution XX-12.

6. REGIONAL ACTIVITIES

6.1 REPORTS OF CHAIRMEN OF REGIONAL SUBSIDIARY BODIES

6.1.1 IOC Regional Sub-Commission for the Western Pacific (WESTPAC)

266 The Chairman of IOC/WESTPAC, Prof. Keisuke Taira introduced this agenda item by referring to the document IOC/WESTPAC-IV/3s. He informed the Assembly that the Fourth Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-IV) was successfully held in Seoul, Republic of Korea, on 22-26 March 1999 hosted by the Government of the Republic of Korea. The Sub-Commission reviewed the WESTPAC activities of the last intersessional period. One of the notable activities was the Fourth IOC/WESTPAC International Scientific Symposium, held in Okinawa, Japan, in February 1998 to celebrate the International Year of the Ocean.

267 **The Assembly expressed its appreciation** to the Governments of Japan and the Republic of Korea for hosting the Fourth IOC/WESTPAC Scientific Symposium and the Fourth WESTPAC Session respectively.

268 Prof. Taira then introduced the progress of GOOS in the region, in particular NEAR-GOOS. NEAR-GOOS has made a considerable advance including a progressive increase of data and users. The Fourth NEAR-GOOS Co-ordinating Committee will be held at the end of September this year and co-operation with NOWPAP and Coastal-GOOS will be discussed. In addition to NEAR-GOOS, two other GOOS activities are initiated in the WESTPAC region, namely SEA-GOOS and PacificGOOS. He noted that there is a plan to submit a draft resolution to the next General Conference of UNESCO in order to get support for the planning of SEA-GOOS.

269 The Delegate of Japan told the Assembly about the recent progress of NEAR-GOOS. The number of users had doubled and the access to the NEAR-GOOS Regional Real-Time Database operated by the Japan Meteorological Agency had increased. Japan translated the NEAR-GOOS Operational Manual that was revised by the Co-ordinating Committee in 1998 into Japanese and distributed it to the Japanese oceanographic community to encourage further participation. The Delegate of Japan stressed the importance of capacity building in the region and introduced two training courses that Japan was going to organize for the WESTPAC region.

270 The Delegate of Japan also informed the Assembly that the Kobe Collection which contains 6.3 million historical marine meteorological data for the period from 1890 to 1960, was partly digitalized and distributed to users, including IOC Member States, in the form of a CD-ROM for enhancing climate related research activities in the WESTPAC region.

271 The Delegate of Australia informed the Assembly about the mandate of the Perth Office which is being established in Australia to facilitate regional GOOS programmes including SEA-GOOS and an Eastern Indian Ocean GOOS.

272 The Delegate of the Republic of Korea informed the Assembly that his Government would do its best to be able to host the Fifth IOC/WESTPAC Scientific Symposium in 2001.

273 The Representative of CSI, the Unit of Coastal Areas and Small Island (UNESCO) drew the attention of the Assembly to the joint IOC-CSI pilot project in the Andaman Sea, emphasizing the truly intersectoral nature of the programme involving CSI, IOC and the Culture Division of UNESCO. This pilot project was in line with the ideas concerning the value of knowledge systems other than science expressed in the UNESCO World Conference on Science held in Budapest (26 June-1 July 1999).

274 **The Assembly recognized** that regional components are essential for the implementation of GOOS and supported the initiation of SEA-GOOS. It was noted that the development of SEA-GOOS would be crucial also for GOOS in the northeastern Indian Ocean, and the **Assembly encouraged** collaboration with the regional programmes of the Indian Ocean.

275 **The Assembly endorsed** the Executive Summary of the WESTPAC-IV with appreciation for the successful implementation of WESTPAC projects during the intersessional period and the future workplan. In this regard, many Member States of IOC/WESTPAC expressed their intention to continue their active participation and contribution to the WESTPAC activities.

276 **The Assembly adopted** Resolution XX-13.

277 **The Assembly emphasized** the importance of data and information for the success of all regional activities and welcomed the IODE Workshop on Ocean Data Management to be held in Langkawi Island, Malaysia in November this year. **The Assembly encouraged** Member States to contribute more biological and chemical data products to the Internet.

278 The Assembly was informed about the WESTPAC meeting held during the Assembly where Member States of the Sub-Commission expressed their concern about the intention of UNESCO to abolish the Science Sector P-4 post serving today of the Secretariat of the WESTPAC Office.

279 **The Assembly expressed appreciation** to the Government of Thailand for its continuous support for the Secretariat office including the provision of secretarial staff and to the Government of The Netherlands for the secondment of an Associate Expert.

280 The Delegate of the Republic of Korea invited the Executive Secretary IOC to take appropriate measures in order to keep the continuity of the WESTPAC activities if the Science Sector of UNESCO abolished a P-4 post in the WESTAC Secretariat.

281 Many delegates emphasized the importance of having an effective secretariat in this region that is perceived as crucial for the successful implementation and development of regional activities. In this respect, **the Assembly invited** the Executive Secretary IOC to make all effort to maintain the post through negotiation with the Director-General of UNESCO in order to avoid discontinuity of WESTPAC activities. The Chairman, Mr Holland reminded the Assembly of the opportunity to discuss the issue of regional secretariats in general after all regional agenda items

had been covered (see below 6.3 General Discussion on Regional Subsidiary Bodies and Decentralization).

6.1.2 IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)

282 The Acting Secretary for IOCARIBE introduced this agenda item, referring to document IOC/SC-IOCARIBE-VI/3s, that summarizes the activities carried out during the past interesessional period.

283 He informed the Assembly of the steps taken towards the implementation of a new Medium Term Strategy and the Sub-Commission's operational structure and co-ordination capability. Actions were implemented in such areas as: (i) internal organization and participation of Member States; (ii) decentralized management and evaluation of regional projects; (iii) mobilization and collaboration with users and other organizations in the region; (iv) strengthening of the capacity for information management and networking.

284 Of the programmes planned for the period 1996-2000, mention was made to the development of national capabilities, following a definition of country profiles. A preliminary version of the report has already been published and widely circulated. The document is also available on a Web site: http://www.ioc.unesco.org/iocaribe . The establishment of information networks will permit the IOCARIBE Secretariat to better fulfill its role of being a facilitator between science and users, and in consistency with the objectives of IOC.

285 Referring to the regional projects, the Acting Secretary for IOCARIBE described those identified as priorities to the region, including the activities associated with OSLR, IODE, ITSU, HAB, Ocean Mapping and lately with GOOS, to name a few.

286 Increase of co-operation and liaison with other international and regional agencies such as LOICZ, CARICOM, CARICOMP, IAS, etc. was reported as an important goal for the Medium Term Strategy of the Sub-Commission.

287 Finally, the Acting Secretary for IOCARIBE informed the Assembly on the intersessional activities that were carried out in the region, with particular reference to the Sixth Session of the Sub-Commission for IOCARIBE and the IOCARIBE Users and GOOS Capacity Building Workshop, both held under the auspices of the Government of Costa Rica, in April 1999.

288 Nineteen countries attended the Sixth Session of the Sub-Commission for IOCARIBE, that was held at the University of Costa Rica, from 26-29 April 1999. Attendance was higher than at any previous IOCARIBE Session. Eight governmental and non-governmental organizations took part in the Session.

289 The IOCARIBE Users and GOOS Capacity Building Workshop was convened the week before the Sub-Commission's session, with the purpose to inform IOCARIBE Member States about the Global Ocean Observing System (GOOS), and to identify and discuss capacity building needs and priorities for the development of GOOS in the region.

290 The main result of the Workshop was the establishment of an *ad hoc* IOCARIBE-GOOS Advisory Group with the tasks: (i) to conduct an assessment of the present capabilities *versus* needs and opportunities; (ii) to produce an initial strategic plan for IOCARIBE-GOOS; and (iii) to recommend steps for formally implementing IOCARIBE-GOOS.

291 The Delegate of Colombia reiterated the increasing support that his Government has been placing to the regional office for IOCARIBE and local administrative staff and urged IOC to continue seeking for the provision of a permanent post for the Office.

292 The Delegate of Cuba expressed his support to the work of the Sub-Commission and stressed the need to re-establish a permanent post of Secretary for IOCARIBE. Referring to the presentation made by the Executive Secretary IOC on the UNESCO Executive Board decision on decentralization (see below 6.3 General Discussion), he pointed out that, to his view, this decision could not be applied to the IOCARIBE for the reason that the office was officially established by an agreement between UNESCO and the Government of Colombia several years ago. He also expressed his support to the recommendations adopted during the Sixth Session of the Sub-Commission for IOCARIBE and in particular to Recommendation SC-IOCARIBE-VI.11 that calls for the development of a Regional Agenda on marine environment and coastal issues, in order to improve the collaboration and integration among the many governmental and non-governmental organizations based in the Caribbean region.

293 The Delegate of Costa Rica echoed the immediate creation of the Regional Agenda and signaled the renewed efforts to integrate the existing agencies and the promotion of a better synergy of important activities in the region. He also stressed the urgent need to develop programmes associated with ocean services, such as GOOS, that ultimately would contribute to the understanding and forecasting of natural phenomena and hazards in the region, such as hurricane Mitch which impacted many countries in that area.

294 The Delegate of Mexico supported the definition of a scientific plan for the region, to be discussed during a meeting planned to be held in Mexico.

295 The Assembly was also very concerned by the statement made in document IOC-XX/2 Annex 10, paragraph 10, to the effect that there is no possibility of recovering the post originally held by the IOCARIBE Secretariat.

296 Finally, the Representative of CSI drew the attention of the Assembly to the IOC input to and benefit from the intersectoral projects on the CSI platform, in particular in the fields of coastal ecosystem services, planning for coastal change and others that are pertinent to sustainable coastal development in the Caribbean.

297 **The Assembly commended** the work of the IOCARIBE Secretariat and manifested their interest in collaborating towards the planning and implementation of IOCARIBE-GOOS activities.

298 **The Assembly acknowledged** an increased participation of the Member States of the region and **stressed the importance** of the Sub-Commission for IOCARIBE as a mechanism for co-ordinating national and regional efforts in the implementation of IOC programmes. The need for the creation of formal links between agencies carrying out marine science activities in the region was emphasized.

299 **The Assembly reiterated** the need for a permanent staff in the regional office and **instructed** the Executive Secretary IOC to give consideration to this question, as it is very important for the successful implementation of IOC programmes in the region.

300 **The Assembly adopted** Resolution XX-14.

6.1.3 Regional Committee for the Southern Ocean (IOCSOC)

301 Mr Yves Tréglos from the IOC Secretariat observed that no progress was made in the activities approved by IOCSOC during recent years. Some Member States emphasized the importance of the Southern Ocean for various scientific aspects and reiterated the need for a dedicated regional committee. The Representative of SCOR outlined many activities that were taking place in the region with IOC involvment. **The Assembly requested** that the activities of the Committee should be reactivated as soon as possible.

302 **The Assembly recognized** that a number of scientific and operational activities (physical, chemical, biological, etc.) are already taking place in the Southern Ocean, implemented by a number of international organizations and agencies. **The Assembly recommended** that these activities should be properly co-ordinated, in order to avoid duplication of efforts.

6.1.4 Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCINCWIO)

303 Dr E. Okemwa, IOCINCWIO Chairman, presented this item, referring to Document IOC-XX/2 Annex 7 on the establishment of an IOCINCWIO Regional Office. Following IOCINCWIO-IV (May 1997), the workplan identified by the Committee is being implemented successfully, thanks to the support of Sida/SAREC (Sweden) and the Government of Flanders (Belgium). Regional activities are undertaken under three headings: operational programmes; communication, data, information and awareness; and capacity building .

304 Dr Okemwa reported on a wide range of implemented activities such as the GLOSS Training Course held in South Africa (November 1998), and the GLOSS Data Analysis Project; the Marine Pollution Monitoring Network, OSLR/HAB and the OSNLR Guidelines on Coastal erosion development; Ocean mapping activities including shoreline mapping; the ODINAFRICA and RECOSCIX-WIO projects; training activities in the field of coastal management and conservation; and the co-operation with WIOMSA.

305 The forthcoming priorities for the region are the launching of ODINAFRICA-II, the publication of coastal erosion guidelines and GLOSS national reports, the continuation of the HAB pilot project (WIO-HAB), and training activities.

306 He stressed the need to reinforce the co-ordination within the region, and recalling the recommendation of the Nineteenth Session of the IOC Assembly, he reiterated the offer of Kenya to host a small regional office, possibly located at the Kenya Marine and Fisheries Research Institute (KMFRI), in Mombasa. He informed the delegates that Kenya would be in a position to support some of the cost of the proposed Office.

307 The Delegate of South Africa informed the Assembly that substantial data holdings are archived at the South African Data Centre for Oceanography (SADCO) and that these are available to the region.

308 Finally, he reminded the Assembly that the IOC/Sida/SAREC agreement was coming to its term at the end of 1999, and thanked Sweden for the major support which contributed to the advancement of marine science in the region. He invited Sweden, and other potential donors to continue their much-needed support to the regional activities of the IOC.

309 The Representative of IOI concluded that IOCINCWIO is a model in terms of regional co-operation, and stressed the necessity to translate marine science products and data to the need of users and decision-makers. He stated that NGOs and in particular the newly established IOI Centre in Kenya could assist in this process.

310 **The Assembly congratulated** the Chairman and the IOC Secretariat with the progress that has been achieved in the last two years, and **noted with appreciation** the shift towards more operational activities and projects. Capacity building was one of the main objectives of the programme in its early years, and the national capacity of IOCINWIO Member States has increased substantially as a result. **The Assembly invited** the Regional Committee to continue its activities in this field.

311 **The Assembly thanked** Kenya for its kind offer and **endorsed** the proposal for the establishment of an IOCINCWIO regional office to be hosted at KMFRI, Mombasa, Kenya, for an initial period of two years after which the issue, including its location, will be reviewed at IOCINCWIO-V. **The Assembly invited** Member States and donors to support the operation of the proposed office.

312 **The Assembly expressed** strong support for the ODINAFRICA-II Project Proposal and urged IOC to submit it to interested donors as soon as possible (see below 6.2 African Agenda).

313 **The Assembly adopted** Resolution XX-15.

6.1.5 Regional Committee for the Central Indian Ocean (IOCINDIO)

314 Dr A.E. Muthunayagam, IOCINDIO Chairman, reported on the implementation of the IOCINDIO workplan, which was approved by the IOC Assembly at its Nineteenth Session. Among other activities it was proposed to establish a regional sea-level network and contribute to the GLOSS programme. As phase I of this project, the Islamic Republic of Iran, Iraq, Sri Lanka, Bangladesh and India have expressed willingness to participate in the project, provide necessary assistance for infrastructure and facilities for establishing the tide gauge stations in their respective countries and take responsibility for operation and maintenance. After getting confirmation from the above Member States, implementation will start. The Workshop on Tide Gauge Data Analysis will be held after establishing the proposed regional sea level network.

315 The Workshop on Modelling Techniques for Predicting Oil Spills, was organized by ROPME and partly supported by IOC, in Bahrain, 15-17 February 1998. The Workshop on Storm Surge Modelling, has been rescheduled to October 1999 and will take place in conjunction with the regional meeting of representatives of Member States to identify a plan of action for the implementation of the project proposal on storm surges for the Northern Part of the Indian Ocean, supported by IOC, WMO and IHP (International Hydrological programme of UNESCO).

316 The GCRMN South Asia Regional Node consisting of India, Maldives and Sri Lanka, funded by the Department for International Development (DFID), UK, through the IOC, is rapidly becoming functional and actively obtaining data on the status of reefs under the guidance of the Regional Co-ordinator. Three workshops were held to provide training, practical experience and improved skills of those who later will train others in GCRMN biophysical and socio-economic monitoring procedures and coral identification. A Regional IODE Training Course on Ocean Data and Information Management was held in Goa, in October 1998. The IOCINDIO Chairman was

also asked to represent IOC at the Ministerial meeting on South Asian Seas programme, held in Pakistan in March 1999.

317 The Chairman stressed the need to develop closer linkages between Member States of the region and with other international organizations, and to establish a standing mechanism for this purpose. He proposed the creation of an IOCINDIO Regional Support Office in consultation with the Executive Secretary IOC, and in accordance with UNESCO procedures. He informed the Assembly that India would be willing to host this office, at no cost to IOC for the first three years.

318 **The Assembly thanked** the Chairman IOCINDIO for his report, and called the attention of the Executive Secretary IOC to the need to implement the remaining part of the workplan, and in particular, the organization of a regional training course on sea-level data analysis and application in co-ordination with GLOSS, and a workshop on Coral Reef Management and Conservation. **The Assembly emphasized** the need to have the Third Session of IOCINDIO before the end of 1999 and expressed thanks to a kind offer of the Delegate of the Islamic Republic of Iran to host a Session of IOCINDIO and the Workshop on Integrated Coastal Studies and Marine Pollution in conjunction with the Session.

319 **The Assembly approved** Resolution XX-16.

6.1.6 Regional Committee for the Central Eastern Atlantic (IOCEA)

320 Dr N'diaga Guèye, Chairman of IOCEA, introduced this agenda item in two parts, referring to the reports of IOCEA-IV, and the Nineteenth Session of the IOC Assembly, and to the 1997 Annual Report.

321 The Assembly was informed of the implementation of the IOCEA-IV Recommandation (Las Palmas, 8-12 May 1995). Many activities had taken place in the Region during the intersessional period, including the GODAR/Africa Workshop, the Workshop on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities in the West and Central African Region. He further most regretfully noted the failure to execute many IOCEA-IV priorities, including the establishment of the Regional Data Centre, due to the lack of resources.

322 Turning to the state of co-operation between the IOCEA Region and the IOC Secretariat, he commended the efficacy of the Executive Secretary IOC and his assistants in co-ordinating PACSICOM and the African Ocean Days (AOD'98). He also warmly thanked the Finnish Government for its financial support of PACSICOM. He welcomed the PACSICOM approach of giving preference to the use of national and regional expertise in Africa.

323 In conclusion, the Chairman of IOCEA thanked donors for their support and Portugal for its proposal to explore the possibility of giving the Region the benefit of the services of one of its aid workers.

324 The Delegate of Senegal spoke of the importance his country attached to the African Ocean Days (AOD'98), which had made it possible to mobilize all sectors concerned by the sustainable development of Senegal's marine and coastal resources. The Delegate of Kenya recommended the establishment of a partnership between IOCINCWIO and IOCEA, including the development of relations between RECOSCIX-WIO and RECOSCIX-CEA.

325 The Delegates of Ghana and Morocco, for their part, deplored the low degree of implementation of the IOCEA-IV recommandation. The Delegate of Morocco also stressed the need to recast the mechanism for co-operation with the Region by developing relations between groups of States according to their geographical situation.

326 The Delegate of Portugal informed the Assembly that the sum of US$50,000, earmarked for programmes in the Region, was no longer available. He proposed that the possibility be explored of making someone from Portugal's aid programme available to the Region and of building up co-operation with other international organizations such as FAO and UNEP, both of which had already carried out many projects to do with fisheries, the environment and tourism. He was supported on this last point by the Delegate of France, who also informed the Assembly of the assistance given by the Brest Centre of the "Institut de Recherche pour le Développement" (IRD, formerly ORSTOM) and by the UTIS programme based in Senegal, in which African experts could participate. France was also prepared to facilitate the participation of researchers from the region in the PIRATA programme and to implement the GODAR/Africa project.

327 The Delegate of Ukraine announced that his country commanded a considerable body of data and was willing to share it with the African States under arrangements to be decided upon.

328 In view of the considerable geographical area covered by the IOCEA Region, the Chairman of IOCEA suggested the establishment of a regional secretariat which will be responsible for co-ordination between the Region and the IOC Secretariat. Observing subsequently that the lack of co-ordination between the Secretariat and the IOCEA Region accounted for the fact that the IOC Annual Report for 1998 made no mention of IOCEA, he requested an urgent designation of a headquarters staff as IOCEA contact person. It was stressed that IOCEA and the specialized agencies of the Region should constitute the focal point for the design, preparation and implementation of projects for the Region, and advocated fuller consideration of the role falling to African States in managing and monitoring the ODINAFRICA project. **The Assembly recommended** that IOC activities in the Region should in future concentrate on assistance for long-term projects using national and regional expertise with the aim of gradually establishing appropriate infrastructure in the Region. **The Assembly instructed** the Executive Secretary IOC to reinforce RECOSCIX-CEA and implement the recommendation of IOCEA-IV.

329 **The Assembly adopted** Resolution XX-17.

6.1.7 Mediterranean

330 The Senior Assistant Executive Secretary IOC, Dr Umit Unluata, introduced the agenda item by drawing attention to the Action Paper (Document IOC-XX/2), the Workshop Report No.155 entitled *Science of the Mediterranean Sea and its Applications* and the report of the Thirty-first Session of the Executive Council (IOC/EC-XXXI/3).

331 Dr Unluata pointed out that this agenda item is specifically concerned with the IOC's efforts towards developing a unified Mediterranean Programme. It reflects the aspiration for the continuation of the IOC's association with the Mediterranean research carried out over the previous two decades through programmes such as PRIMO in the Western Mediterranean and POEM in the Eastern Mediterranean which left behind as a legacy remarkable results that made Mediterranean oceanography better understood. He recalled that the efforts towards a unified Mediterranean Programme had, in fact, been started at the Eighteenth Session of the IOC Assembly when the Executive Secretary IOC was instructed to take appropriate actions for development.

332 In particular, and in line with the recommendation of the July 1997 IOC Workshop on Science of the Mediterranean Sea and its Applications, several Member States recommended at the Thirty-first IOC Executive Council held in November 1998 that IOC develop a unified Mediterranean Programme.

333 **The Assembly noted** that what is meant by the development of a unified Mediterranean Programme is the formulation by IOC, through co-ordination with other relevant bodies and programmes, of a harmonized, regional co-operative programme for the whole Mediterranean basin, by building on recent research results, taking into account other relevant global programmes (e.g. IGBP), avoiding duplication and ensuring the involvement of the scientists from the southern Mediterranean institutions.

334 **The Assembly expressed satisfaction** that efforts are thus underway for the formulation and publication of a science plan for the IOC Mediterranean Programme that is based on: (i) the results of the IOC workshop held in July 1997, (ii) the recommendations of the IOC-EU-IO-NCMR-Greece international conference held in Athens in February 1999, and (iii) the additional issues/needs/opportunities related to ICAM, GLOSS, GOOS and capacity building. **The Assembly recommended** that an institutional consultation with a series of major stakeholders, including EU Mediterranean Programmes, MAP/UNEP, ICSEM, among others, be organized so as to help ensure proper co-ordination and harmonization to avoid duplication, and to acknowledge partnerships. Based on this meeting of the stakeholders, an implementation plan that includes training and capacity building will be developed.

335 **The Assembly stressed** that the science plan for the unified Mediterranean Programme should clearly identify the objectives of the research activities to be carried out and that the research programmes should specifically be designed to serve the scientific needs and requirements of MedGOOS, MedGLOSS, ICAM for the Mediterranean, and associated capacity building.

336 **The Assembly reiterated** the recommendation of the Thirty-first Session of the IOC Executive Council by emphasizing that this initiative should be discussed with other international bodies and stakeholders involved in the Mediterranean research activities, especially the European Union.

337 **The Assembly instructed** the Executive Secretary IOC to: (i) take appropriate actions for the development of a Science Plan for the Unified Mediterranean Programme, in association with MedGOOS, GLOSS (MedGLOSS) and the Mediterranean ICAM, to be followed by a stakeholders meeting to assess the financial requirements of the Programme; (ii) ensure that duplications in research themes and area coverage are avoided, and (iii) report the results of these actions to the Thirty-third Session of the IOC Executive Council.

6.1.8 Black Sea

338 Prof. V. Eremeev, Chairman of the IOC Black Sea Regional Committee (BSRC), introduced this agenda item referring to activities described in the Addendum to the Action Paper (Document IOC-XX/2 Add. & Corr.) and determined by Resolutions XVIII-17 and EC-XXIX.7. In 1998-1999, IOC BSRC has focussed its work on the implementation of two pilot projects PP1 (Black Sea GOOS) and PP2 (Black Sea Fluxes). The main results were summarized at the meeting of the BSRC officers held during the Thirty-first Session of the IOC Executive Council (November 1998) and at the Second IOC BSRC Session, held in Istanbul in May 1999. The Assembly was informed that the BSRC prepared a draft Memorandum of Understanding between the Black Sea riparian

countries on implementation of Black Sea GOOS and advanced scientific plans of the projects PP1 and PP2 for 1999-2001. The Chairman of the BSRC reviewed the present ecological situation in the basin, and identified gaps and needs for future Black Sea research and related services as well as the international framework for co-operation with WMO, UNEP, NATO, EU, IAEA and some other governmental and non-governmental organizations.

339 A number of Member States supported the regional programme and emphasized the need for continuing support.

340 The Delegate of Bulgaria emphasized some changes in the region including the deterioration of the ecological situation in the Black Sea and contamination of the coastal waters. He expressed the necessity to mobilize national resources and use the potential of regional co-operation in implementation of the Black Sea programme. He proposed an international conference "Black Sea Fluxes" to be held in Varna (May 2000) with the financial support of IOC and IAEA.

341 The Delegate of the Russian Federation stressed the importance of the "Black Sea GOOS" project. He suggested that "Black Sea GOOS" be considered as a contribution to EuroGOOS.

342 The Executive Director of the International Ocean Institute (IOI) supported BSRC activities. He emphasized the successful start of the "Black Sea GOOS" and "Black Sea Fluxes" projects. The new regional branch of IOI, established in Constantza (Romania) intends to develop an effective co-operation with BSRC.

343 **The Assembly stressed** that it will be very useful to develop co-operation with the Black Sea Economic Co-operation (BSEC), WMO, IAEA, IOI, and other organizations interested in the region.

344 **The Assembly noted** that BSRC may be very supportive to the initiative of WMO and BSEC in preparing the "Black Sea Hydrological Cycle Observing System" project. **The Assembly recommended** establishing co-operation between "Black Sea GOOS" and EuroGOOS and the holding of a GOOS Capacity Building Workshop for the Black Sea Region early in 2000.

345 **The Assembly approved** the structure and terms of reference of the Chairman, Vice-chairman and Executive Secretary of the BSRC included in the Summary Report of the Second Session of the BSRC held in Istanbul, Turkey, 3-5 June 1999.

346 **The Assembly adopted** Resolution XX-18.

6.1.9 Caspian Sea

347 The Deputy Executive Secretary IOC, Dr Iouri Oliounine, informed the Assembly of the action taken in response to the implementation of Resolution XIX-14 on IOC activities in the Caspian Sea; among them, the support to the Cousteau Society cruise during the IYO, the organization of consultations in Paris on the state of the Caspian Sea environment, the discussion of the issue at the International Forum "Great Rivers' 99" held in Russia in May 1999 and the participation at the briefing on the Caspian Sea problems held in Budapest on 29 June within the World Conference on Science, with the participation of the Director-General of UNESCO, Federico Mayor.

348 He described the problems facing the Caspian Sea: sea-level rise, over-fishing and pollution.

349 He emphasized the need to develop a co-ordinated programme within UNESCO and with other international organizations on the protection of the Caspian Sea environment in order to avoid duplication of efforts and to increase their effectiveness.

350 **The Assembly agreed** on the need for IOC to take a lead in developing an action plan for the Caspian Sea protection jointly with IHP and MAB of UNESCO and other international organizations with an interest in the Caspian Sea protection. It was stressed that the Caspian Sea problem is not a local one and that experience gained in the Caspian Sea protection will be very useful in other geographical areas.

351 **The Assembly noted** a kind offer of the Russian Delegation to use facilities and experience of the Fisheries Research Institute in Astrachan (Russian Federation) for implementing capacity building and training activities and **instructed** the Executive Secretary IOC to study ways of including the Institute in future plans.

352 **The Assembly complimented** Mr G. Koulbanis, Representative of the Cousteau Society on the results of the cruise and the production of a concise cruise report in French and English. **The Assembly recommended** that the report be translated into Russian and be made widely available.

353 **The Assembly agreed** that the problems posed by the Caspian Sea may be solved by using modern technology for on-site data gathering, distributing information and educating the public, provided that political will, and resources be available.

354 **The Assembly agreed** that urgent action should be taken and necessary funds allocated.

355 **The Assembly adopted** Resolution XX-19.

6.2 AFRICAN AGENDA

356 The item was introduced by the IOC Chairman, Mr G. Holland. He recalled that the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM) and the Cape Town Conference on Co-operation for Development and Protection of the Marine and Coastal Environment in Sub-Saharan Africa had been attended by close to fifty delegates at ministerial level. He expressed his gratitude to the Government of South Africa for its dynamic chairing of the Cape Town meeting, which had brought the partnership to fruition. He informed the Assembly that in 1999, two major events, preparing for the Partnership Conference, had taken place: a meeting in January 1999 in Nairobi, coinciding with the UNEP Governing Council, and a second in New York, coinciding with UNCSD Assembly. In both cases, the IOC was represented by its Chairman.

357 He continued saying that the Partnership Conference, planned to take place early 2001, will be a major step in a long-term programme. He stated that maybe the most important result of the PACSICOM process is the strong conviction of the African States that the continent must be developed by Africans for Africans. During the Partnership Conference, the African Member States will submit project proposals to donors in a true partnership spirit with clear contributions from both partners.

358 The Executive Secretary IOC explained that this agenda item responded to the fact that there was a need to harmonize existing projects of the Commission based in Africa with the PACSICOM follow-up. He recalled the important role of UNESCO and its IOC in providing leadership during the organization of the PACSICOM Conference, which was supported by UNESCO-IOC-UNEP

and the Governments of Mozambique and Finland. He noted further that the PACSICOM Conference had grown into a PACSICOM process and that, in this enlarged context, IOC was no longer just addressing technical issues. The PACSICOM process will also address the fund-raising strategies needed to obtain the resources for implementing the sustainable use of the coastal zones of Africa.

359 **The Assembly adopted** Resolution XX-20.

360 Attention was called to the importance given by UNESCO to Africa through the establishment of a special department 'Priority Africa' headed by its own Assistant Director-General.

361 The Executive Secretary IOC called on Member States to provide guidance on how the IOC should proceed as a partner in PACSICOM. He pointed out that the limited financial and staff resources at the IOC Secretariat jeopardize the leadership role in the follow-up.

362 The Delegate of Mozambique expressed his Government's appreciation for the support provided by IOC, UNESCO, the Government of Finland and UNEP for their substantial support for the PACSICOM Conference. He expressed the hope that IOC will continue to play a leading role in the PACSICOM follow-up, e.g. through GOOS-Africa, the establishment of the UNITWIN UNESCO Chairs network in Environmental, Marine Science and Oceanography, and Technology in Africa, including Benin, Mozambique, Senegal and South Africa.

363 The Delegate of Finland expressed his Government's appreciation for the success of the PACSICOM Conference as a solid example of co-operation between UN agencies. He welcomed the 'graduation' of the Conference to a Process, but stressed the need for assessment elements in the PACSICOM process and follow-up activities. He also expressed the need for the establishment of a co-ordinating structure in support of the entire PACSICOM process until the Evaluation Conference, tentatively planned to be held in 2003. The Delegate expressed Finland's commitment to continue its support to PACSICOM.

364 The Representative of the Organization of African Unity (OAU) expressed his organization's appreciation for the support provided by Mozambique, Finland, UNESCO, IOC, and UNEP to the PACSICOM Conference. He re-stated that the OAU's mandate includes coastal and marine resources management, and that its implementation has been assigned to the Scientific and Technical Research Commission (STRC). He recalled Resolutions EC-XXXI.6 and EC-XXXI.7, calling for the strengthening of co-operation between IOC and OAU/STRC.

365 The Representative of CSI (of UNESCO) informed the Assembly about the key roles that communication and education play in disseminating the sustainable coastal development message, and referred to the follow-up being given to the intersectoral technical workshop on this topic held at PACSICOM.

366 **The Assembly recognized** that an integrated comprehensive observation network in the Tropical Indian Ocean, to be associated to the existing ones in the Tropical Atlantic and Pacific oceans, is of utmost importance to complete the global understanding of ocean and climate processes in the equatorial region. It therefore requests the IOC Secretariat to investigate with other IOC/WMO bodies the means for supporting the set up of such an array of moored buoys similar to the existing TAO and PIRATA ones, for the Tropical Indian Ocean.

367 **The Assembly also recommended** that the IOC Secretariat investigate the means to enhance the PIRATA array through its appropriate channels, with emphasis to the Eastern Atlantic Ocean.

368 **The Assembly reaffirmed** its support to Resolutions EC-XXXI.6 and EC-XXXI.7 on PACSICOM and Priority Africa, and **stressed** the importance of intersectoral co-operation and co-ordination in UNESCO.

369 **The Assembly adopted** Resolution XX-21.

370 **The Assembly further reaffirmed** its support for the ODINAFRICA-II project of IOC as a pioneer Pan-African Capacity Building and Operational Services programme, but stressed the need to ensure full involvement of all concerned African Member States in the project's development and implementation. To this end, a representative ODINAFRICA Steering Committee will be established within the region.

371 **The Assembly expressed** its high appreciation for the important role of UNESCO and its IOC in the organization of the PACSICOM Conference. **The Assembly called on** the IOC to play a leading role in the PACSICOM process, and to contemplate the provision of assistance and guidance to African Member States in the development of project proposals in preparation for the Partnership Conference.

372 **The Assembly adopted** Resolution XX-22.

6.3 GENERAL DISCUSSION ON REGIONAL SUBSIDIARY BODIES AND DECENTRALIZATION

373 The Executive Secretary IOC noted that there is a substantial mismatch between the programme and budget proposed and reviewed for approval by the Programme and Budget Committee, and the funds being requested in Draft Resolutions from regional bodies. He explained that there are actually very few UNESCO posts (9 Professional posts), and that in order to enable carrying out an extensive work programme, he had adopted a policy of using funds from vacant permanent staff posts to recruit contract staff, thereby improving our ability to meet programme commitments. Calling the attention of the Assembly to the Executive Board's decision on decentralization (*Proposed guidelines for the rational implementation of decentralization*, 156 EX/Decisions 5.1), he then noted that if one of these UNESCO posts is shifted to a region it will seriously compromise IOC's ability to meet its basic programme commitments. He referred to an alternative model used by IOC in establishing the Perth Regional Programme Office, where a project office is funded by extra-budgetary resources, and run with contract staff. Furthermore, in the case of the Perth Office, a sunset clause is included since the commitment of the donor Member States extends for three years and a full evaluation of the effectiveness of the office is scheduled after the second year. A solution to the mismatch between the requests contained in draft resolutions and the actual budget, is to recommend that the requests for regional offices exceeding the budgetary ceiling proposed, be met through obtaining extra-budgetary resources for the employment of a contract staff, or, where available, staff seconded from Member States.

374 **The Assembly recognized** the constraints placed on the management of IOC by the 156th Executive Board of UNESCO, in which a zero growth budget is expected and was of a general agreement that the Executive Secretary IOC should make best use of the budget in the most flexible way to meet as many demands placed on IOC by Member States as possible**.**

375 The Executive Secretary noted that IOC is undergoing an external evaluation of its programmes and management by an evaluation team which, among other things, will make an in-depth evaluation of WESTPAC programme activities and Secretariat. This will hopefully help to consolidate the advice sought by Member States on regional offices and programmes.

376 The Executive Secretary IOC noted that the regular programme budget at best was likely to remain constant in future in all UN organizations. To survive and prosper, IOC must be prepared to bring in more extra-budgetary funds. At present IOC is generating US$1.2 for every US$1 from UNESCO Regular Programme.

377 Some Member States noted that there were other ways of raising the IOC's regional profile than by creating IOC offices. The Delegate of Canada suggested that IOC could capitalize on existing regional bodies, placing IOC staff in the offices of other appropriate international organizations co-operating in the implementation of the IOC Programme so as to benefit from existing investments in infrastructure and communication networks. In particular, this would serve to reduce the multiplicity of UN organizations. A Memorandum of Understanding could be made between IOC and such organizations to ensure that they handled IOC business in the most appropriate way and with the necessary regular supervision.

378 **The Assembly reaffirmed** the importance of the regional subsidiary bodies as mechanisms to address the specific needs of Member States at the sub-regional level, especially for developing countries. However, **the Assembly recognized** that there are some deficiencies in the operation of some of the regional bodies which need to be corrected and accordingly, **recommended** a comprehensive evaluation of the IOC regional subsidiary bodies with regard to their impact and value.

379 As a means to improve the implementation of the workplans of the regional subsidiary bodies, to ensure indigenous commitment and involvement, and to facilitate co-ordination between the regions and the Secretariat, the **Assembly recommended** the establishment or strengthening of IOC regional offices as programme or project support offices. It was emphasized that contractual arrangements for staff be established to demonstrate a long-term commitment to support the office.

380 **The Assembly stressed** that, in view of the budgetary constraints of IOC and UNESCO, Member States in the regions concerned must contribute to the establishing and operation of regional offices, as in the case of the Perth Office.

381 **The Assembly adopted** Resolution XX-23.

7. CAPACITY BUILDING IN MARINE SCIENCES, SERVICES AND OBSERVATIONS: TEMA

382 This item was presented by the Executive Secretary IOC, who introduced briefly the TEMA concept as a cross-cutting activity of all IOC programmes and informed the Assembly about the creation of a secretarial mechanism to co-ordinate efforts. He then reported on the TEMA-related activities carried on from January 1998 up to July 1999. He noted that 64% of all the activities were financed with extrabudgetary funds. The Executive Secretary also expressed that to balance capacity among Member States, IOC needs to develop short, medium and long-term capacity building activities, focusing on regional needs and co-ordinating with donor agencies.

383 Mr V. Scarabino, Co-ordinator of TEMA, presented Document IOC-XX/2 Annex 8, which contains information on internal and external structures relevant to the TEMA activities co-ordination, monitoring and implementation.

384 A number of delegates expressed their views on the ways to increase the effectiveness of the TEMA activities within IOC. The Delegate of Germany informed the Assembly about the experience and the efforts of his country in the co-ordination of all national capacity building activities working closely with donor agencies. **The Assembly expressed** a need for a survey, among Member States of their needs and contributions to capacity building in order to consider them in meeting regional demands. The Delegate of the Republic of Korea gave information about the next IOC/KORDI Training Course on Coastal Conservation to be held in September 1999 for nationals of WESTPAC countries.

385 The Delegate of the Russian Federation informed about the progress in implementing the Floating University project in the Black, Mediterranean and Baltic seas with an objective to train specialists in the field of marine geology, geophysics and ecology.

386 **The Assembly supported** the proposed new mechanism of co-ordination and Member States expressed readiness to offer their experience at national or regional levels for contributing to the implementation of this new approach. It was proposed that in order to implement the tasks of the internal management group and the external advisory groups effectively, a clear definition of a workplan and time schedule should be made. It was further suggested that Chairpersons of regional and technical subsidiary bodies be members of the TEMA Advisory Group.

387 The Delegate of Cuba stressed the importance for the Executive Secretary IOC to be the Chairperson of the internal management group. He also expressed concern that the TEMA Co-ordinator in the present structure reports to one of the three Heads of Section instead of reporting directly to the Executive Secretary IOC.

388 **The Assembly supported** further, the idea of partnership. It was noted that most donor agencies preferred to work on a bilateral basis. However, the regional projects may be of interest to some of them. It was also proposed that IOC could start working with the donors developing small projects, for example, in the framework of the African Agenda.

389 **The Assembly reiterated** the importance of the Training-through-Research (TTR) concept and recommended that the Floating University cruises be continued as an effective means to offer "hands-on" training to young scientists.

390 **The Assembly expressed** the satisfaction with the development of IOC TEMA Web Page that can be used as a discussion forum for Member States.

391 **The Assembly proposed** to use the next Executive Council to evaluate the advancement of the agreed upon mechanism through a report submitted by the Secretariat on the advances in the implementation.

392 It was decided to have a meeting of the TEMA sessional group during the next Executive Council, taking advantage of the presence of the chairpersons of regional bodies and technical committees, to evaluate the development of the programme.

8. EVOLUTION OF THE IOC WITHIN UNESCO: REPORT OF THE 29th GENERAL CONFERENCE AND 156th EXECUTIVE BOARD OF UNESCO

393 The Executive Secretary IOC, Dr P. Bernal introduced this item, referring to information and documents provided by the IOC to the UNESCO Governing Bodies and to the results of the deliberations of the UNESCO Executive Board on the issue of the IOC's functional autonomy. The Executive Board of UNESCO took note of the administrative and financial measures taken by the Director-General so as to give IOC operational flexibility within the framework of its functional autonomy and invited the Director-General to present to the Executive Board at its 157th session the modified Statutes and Financial Regulations of the Commission.

394 **The Assembly expressed** its satisfaction with the development of IOC as an autonomous body within UNESCO. **The Assembly congratulated** the Executive Secretary on his efforts in the establishment of new relationship between IOC and UNESCO's other programmes and governing bodies.

9. CO-OPERATION WITH THE UN AND OTHER INTERNATIONAL ORGANIZATIONS

9.1 CO-OPERATION WITH UN ORGANIZATIONS

395 The Executive Secretary IOC introduced the agenda item by making reference to recent responsibilities of the IOC Secretariat as the Chair of the Administrative Committee on Co-ordination (ACC) Sub-Committee on Oceans and Coastal Areas (SOCA), noting that the IOC 1998 Annual Report, Section 7.1 provides information on some of the related issues and activities in greater detail. In addition, the Assembly's attention was drawn to the Action Paper (Document IOC-XX/2, para. 201-203).

396 The Executive Secretary IOC recalled that ACC-SOCA's composition is such that it is open to all ACC members, which include, among others, FAO, IMF, IMO, ITU, UNESCO, UNIDO, WHO, WMO, IAEA, WTO, UNDP, UNEP, UN-DESA, UN-DOALOS, the World Bank and the Secretariats for CBD and FCCC. The mandate of the Sub-Committee is to monitor and review progress in the implementation of Chapter 17 of Agenda 21, acting as an inter-agency facilitating mechanism for the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. It reports to the Inter-Agency Committee on Sustainable Development (IACSD). IOC has been appointed as the permanent Secretariat of SOCA since its establishment in 1993. The various agencies participating in the Sub-Committee have been given responsibilities as Chapter 17 sub-task managers. The IOC acts as the Sub-Task Manager in Programme Area E of the Chapter 17, which is concerned with critical uncertainties for the management of the marine environment and climate change. IOC also assists other sub-task managers in the Programme Areas of Chapter 17 either as a participating agency or as an associated agency.

397 The Executive Secretary IOC indicated one of the reasons for his acceptance of the challenge of becoming the Chair of SOCA was the new possibilities of inter-agency co-operation in regional activities, especially in regions such as the Caribbean, where a multitude of UN agencies carry out activities related to their mandates.

398 The Executive Secretary IOC summarized one particular project of ACC-SOCA that is concerned with the development of a global UN Atlas of the Ocean. This project involves all UN agencies dealing with oceans as well as a private publisher and many other centres of excellence. The project will start in the second half of 1999 and benefits from catalytic funding from the Turner Foundation. The project funds available cover the core costs of the Atlas, and each agency involved is expected to contribute, in-kind or cash, some additional resources (monitoring data information, staff time, travel funds for co-ordinating meetings, etc.). A CD-ROM containing the project demonstration was developed and presented at EXPO' 98 in Lisbon.

399 The project intends to develop a book, a CD-ROM as well as a series of dedicated Web sites. Each collaborating agency will have the lead for an area of competence and will provide the Atlas with:

. Short and illustrated papers on policy issues within its area of competence (policy electronic "posters");
. Analyses of strategic trends (in space and time) and outlooks (with maps, charts);
. Short case studies, illustrating the policy issues;
. Illustrations (photos, maps) with policy relevance;
. Country indicators and simple aggregated statistics.

400 IOC's participation in the UN Atlas of the Ocean Project implies its involvement in policy advice and policy reporting issues such as those related to El Niño, climate change, accurate monitoring of marine pollution, sea-level change, status of coral reef, oceanographic data availability.

401 **The Assembly welcomed** the new responsibilities of the IOC Secretariat as regards the ACC-SOCA.

402 **The Assembly encouraged**, through ACC-SOCA mechanisms, proof-of-concept exercises in inter-agency co-ordination in specific regions.

403 **The Assembly noted** that efforts must be made by the delegates of the Member States attending the coming UN General Assembly to represent IOC's interests in calls for development measures to ensure better co-ordination of the UN work on oceans and seas, and in suggestions for initiatives to improve co-ordination and integration.

404 **The Assembly endorsed**, on the basis of the explanations provided by the Executive Secretary, the IOC participation in the development of the UN Atlas of the Oceans.

405 **The Assembly instructed** the Executive Secretary IOC to take appropriate actions to ensure the effective participation of IOC in the development of the UN Atlas of the Oceans.

9.2 FOLLOW-UP TO UNCED, INTERNATIONAL OCEAN ASSESSMENT

406 The Integrated Global Ocean Services Strategy (IGOS) and the International Ocean Assessment were considered under this agenda item.

407 Dr Colin Summerhayes, Head of the Operational Observing Systems (OOS) Section of IOC, introduced IGOS, calling attention to the notes in the Action Paper (Document IOC-XX/2) and to Resolution EC-XXXI.8. He explained that the intention of the IGOS partnership was to unite major

satellite and *in situ* observing systems in a common framework designed to deliver maximum effectiveness and benefit, and to add value. The Partners comprise the sponsors of the global observing systems (IOC, UNESCO, UNEP, WMO, FAO and ICSU), plus the space agencies as represented through the Committee on Earth Observation Satellites (CEOS), along with representation from the WCRP, the IGBP and IGFA (International Group of Funding Agencies for global change research). The Partners meet twice yearly to discuss the on-going development of the Integrated Global Observing Strategy (IGOS), which is a strategic planning process linking research and operations as well as data suppliers and users.

408 One key function of the IGOS Partners is to be able to demonstrate to governments that the different agents in global observing are working closely together to a common strategy so as to cut costs and increase effectiveness. Another function is to promote awareness of nations to the value of global observations and the need for resources to ensure the arrival of associated benefits.

409 IGOS Partners are concentrating their efforts on "themes". The first to be selected is *the Oceans*. Within any one theme, practical demonstrations and tests of the IGOS concept will be made through pilot projects. In *the Oceans* theme project the main pilot is the Global Ocean Data Assimilation Experiment (GODAE).

410 **The Assembly welcomed** the development of IGOS as a mechanism for developing synergy between a wide range of partners with complementary interest, and endorsed Resolution EC-XXXI.8, which recommends that the IOC become a Partner in the IGOS Partner's Forum.

411 The discussion on International Ocean Assessment was introduced by Dr John Field, President of SCOR and elaborated on by Dr Summerhayes. An ocean science assessment was called for by the 69th meeting of the Executive Board of ICSU (Thailand, 1995), and at the Twenty-ninth Session of the Executive Council of the IOC (Paris, 1996), and was subsequently endorsed by the Nineteenth Assembly (1997) and the Thirty-first Executive Council (1998) of IOC. IOC, in collaboration with SCOR and SCOPE, is conducting an assessment and analysis of the state of marine science, identifying key scientific issues for sustainable development, and evaluating the capability of the scientific and governmental communities as well as the private sector to respond to these issues and apply the results to meet the needs of society in different parts of the world. The exercise will lead to a substantial report that will guide the community in selecting its priorities at the beginning of the the coming millennium.

412 The next stage is a workshop in Potsdam, Germany, from 2 to 8 October, 1999, at which 60 invited attendees will address key issues focussing on: (i) coastal seas; (ii) fisheries and aquaculture; (iii) navigation and off-shore industry; (iv) climate; and (v) basic sciences. Cross-cutting issues to be addressed include the needs for (vi) instrumentation, (vii) training, education and capacity building; and (viii) organization and co-operation. The proposed title for the workshop is "Oceans 2020: Science for Future Needs".

413 **The Assembly noted** that the proposed workshop was a look at the whole of marine science and how it had evolved recently and where it was likely to go, so as to guide both IOC and SCOR in selecting priorities, and to enable us to identify more clearly the links between science and sustainable development in the marine environment.

414 **The Assembly welcomed** the progress being made in developing the assessment and recommended that this assessment should be complementary to the other assessments carried out by the IOC such as the IOC external overall assessment mandated by the Executive Board of

UNESCO, or the assessment of OSLR and associated science programmes mandated by the Thirty-first Session of the IOC Executive Council.

9.3 IOC AND UNCLOS

415 The IOC Chairman introduced this item, referring to the Action Paper (Document IOC-XX/2) and the "Summary Report of an Informal Advisory Consultation on Implementation of IOC Assembly Resolution XIX-19, UNESCO, Paris 2-3 November 1998" (Document IOC/INF-1114). He informed the Assembly that the Executive Secretary IOC sent Circular Letter No.1595 requesting Member States to nominate two national experts to the Advisory Body of Experts on the Law of the Sea (ABE-LOS). Only 17 countries responded to the above circular letter.

416 **The Assembly agreed** with the programme of work of ABE-LOS as indicated in Document IOC/INF-1114. It was suggested that Document IOC/INF-1055 on Article 247 of UNCLOS be redrafted to serve as guidelines.

417 The Delegate of the United Kingdom asked the Executive Secretary IOC to collect information on Member States' implementation of the provisions on marine scientific research. The Delegate of France noted that the Assembly should be requested to endorse the ABE-LOS work programme and not its terms of reference, which are already accepted. The Delegate of the Russian Federation pointed out that regarding the implementation of Part XIII of UNCLOS on marine scientific research, the IOC planned many activities in the framework of GOOS. He also drew attention to the need to co-ordinate the states' practices and recommended a close relation between IOC and the International Tribunal for the Law of the Sea. The Delegate of Nigeria noted that 17 countries out of 126 Member States is a small response and suggested a re-circulation of the nomination request.

418 The Chairman stated that ABE-LOS should have a smaller sub-group of experts geographically distributed. The Executive Secretary IOC pointed out that the ABE-LOS will not be a body with frequent plenary meetings and added that he would like to be instructed on the follow-up of the list of priorities indicated in Document IOC/INF-1114.

419 **The Assembly stressed** the importance of UNCLOS for IOC and pointed out that fulfilling the role of IOC in its implementation was a first priority for the Commission. It was recommended that the IOC Secretariat circulate a reminder to Circular Letter No.1595 to facilitate the organization of the first meeting of ABE-LOS in early 2000 as planned in the IOC Programme and Budget for 2000-2001. **The Assembly suggested** that during this first meeting, a small drafting group of experts be formed to co-ordinate the activities of ABE-LOS. **The Assembly instructed** the IOC Secretariat to initiate a close collaboration with UN/DOALOS, IMO and WMO, and to accelerate the implementation of ABE-LOS.

9.4 PROGRESS IN IMPLEMENTING DECISIONS OF THE INTERNATIONAL CONFERENCE ON SMALL ISLANDS DEVELOPING STATES

420 Mrs Grignon-Logerot, Senior Special Assistant to the Executive Secretary IOC introduced this item recalling that in implementing Small Island Developing States (SIDS) related activities, IOC has concentrated its efforts on the management of coastal zones, which have a major interest for Member States. In this regard, a pilot study was conducted in 1998 on the inventory and cartography of the shallow waters around the island of Mahé (Seychelles), in partnership with the Government of the Seychelles, the Indian Ocean Commission and its environment programme, and

with funds from the European Commission and the IOC. This study led to the production of an atlas of the sensitivity and vulnerability of the shallow waters of the island of Mahé. The atlas includes an analytical file and recommendations about management for each zone.

421 The atlas has multiple uses. It provides a guide for policy makers, allowing them to set the environmental standards needed for coastal management. It is also useful for deciding on priorities in selecting coastal zones for protection, for minimizing conflicts of usage and diminishing the pressure on the marine environment in regulating the use of ocean space for fishing, tourism, and shipping. The guide contributes to the elaboration of plans for integrated coastal management of the coast of Mahé. It also provides marine specialists with a basic reference for studying the state of these environments. Lastly, it provides an information document for the public and tourists on the value and sensitivity of different environments.

422 **The Assembly acknowledged** support provided by France and Sweden for the development and publication of the atlas and by the Indian Ocean Commission for providing training, especially in the utilization of Geographic Information Systems (GIS).

423 This project has been included in the 3rd volume of the *Sustainable Development Success Stories* prepared for the 7th session of the Commission of the Sustainable Development.

424 Dr D. Troost, Chief of the Coastal Regions and Small Islands Unit (CSI) of UNESCO recalled that the IOC Assembly, at its Nineteenth session indicated that the "*scientific inputs of the IOC should be ensured, as well as the feedback from the results of the CSI project to the IOC programmes*" (Summary Report IOC-XIX/3, para. 416). Good progress in this respect was reported by referring to the CARICOMP and other activities.

425 Dr Troost noted that promoting a Culture of Peace is UNESCO's overall objective. To meet this objective, a sustainable balance between land, sea and people is being fostered on the CSI platform. Co-operation with IOC aims at elaborating wise coastal practices for sustainable human development. IOC provides the marine science component to an increasing number of intersectoral pilot projects, including in the Caribbean, Indian Ocean SIDS, Philippines, Thailand and Tunisia. Examples of wise coastal practices are presently exchanged and commented upon *via* a dedicated Web site.

426 Some delegations acknowledged the holistic and co-operative approach with which the CSI activities are carried out.

9.5 CO-OPERATION WITH THE EUROPEAN UNION

427 Mr Jean Boissonnas, Representative of the European Commission's DG12, introduced the Fifth Framework Programme (FP) of research of the European Union. Most of EU-funded marine research, previously carried out under the Marine Science and Technology (MAST) thematic programme of FP4, is distributed in the new FP5 (1998-2002) among two key-actions of a thematic programme on Energy and Environment: Global Change, Climate and Biodiversity on the one hand, and Sustainable Marine Ecosystems on the other hand. FP5 also provides for support to the networking of major European research institutions. Mr Boissonnas also summarized the rules for the participation of EU scientists and researchers from other countries. Finally, Mr Boissonnas expressed satisfaction with the co-operation between the European Commission and IOC in the field of ocean data management and exchange. He stressed the potential for reinforcing contacts

between the two organizations, especially in operational oceanography and forecasting, on harmful algal blooms and on a regional basis - as in the Mediterranean and the Black Sea.

428 **The Assembly endorsed** and **encouraged** the co-operation between EU and IOC and **recommended** that regular consultation and exchange of information between the two organizations continue.

9.6 CO-OPERATION WITH ICSU

429 The President of SCOR, Prof. John Field (South Africa), referred to the IOC's co-sponsorship of the programme on Global Ocean Ecosystem Dynamics (GLOBEC) which is a component of the OSLR programme. IOC also co-sponsors the Carbon Dioxide Advisory Panel within SCOR's Joint Global Ocean Flux Study (JGOFS). A third major area of joint interest is the new SCOR-IOC programme on the Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB), another important component of the OSLR programme. Lastly, Prof. Field expressed his appreciation to IOC for its support of several SCOR working groups and of the International Ocean Colour Co-ordinating Group (IOCCG). He stated his expectation that the fruitful partnership between SCOR and IOC would continue and reiterated that SCOR would make every effort to respond to any requests from IOC for scientific advice.

9.7 CO-OPERATION WITH OTHER ORGANIZATIONS

430 Dr G. Kullenberg, Executive Director of the International Ocean Institute (IOI), reported that his organization is co-operating with the IOC in ICAM and MedGOOS development. IOI stands ready to extend the co-operation through its regional activities in Africa, the Caribbean, WESTPAC and IOCINDIO regions. The IOI is also interested, in interaction with the IOC, in the context of Ocean Governance and UNCLOS.

431 The North Pacific Marine Science Organization (PICES) was reported on by its Chairman Dr Hyung Tack Huh. PICES was established in 1992. The current member countries are Canada, Japan, the People's Republic of China, the Republic of Korea, the Russian Federation, and the United States of America. PICES promotes co-ordinated marine scientific research and information exchange in the North Pacific and adjacent marginal seas, particularly north of 30 degrees North. It provides fora, such as symposia, workshops and annual meetings related to the ocean environment and the impact of human activities, and strives to stimulate national and regional efforts in key research areas through its working groups, scientific committees and programmes.

432 PICES has been working closely with other international organizations to contribute to both regional and global research programmes. For example, PICES has recently formed a working group on CO_2 in the North Pacific, and organized, jointly with IGBP-JGOFS/LOICZ, a workshop on Carbon Cycle in the North Pacific during the PICES VII Annual Meeting held in Fairbanks, Alaska in October 1998. PICES is also planning to hold "Beyond El Niño: A Conference on the Pacific Climate Variability and Marine Ecosystem Impacts, from the Tropic to the Arctic" in March 2000. The PICES-GLOBEC Programme on Climate Change and Carrying Capacity (CCCC) is a regional component of the international GLOBEC effort. Through these activities, PICES is building close ties with other organizations as well, and looks forward to growing co-operative links with IOC and its sub-regional bodies, especially WESTPAC. In spite of being a young organization, PICES has been effective in bringing together oceanographers from different countries, and facilitating collaborative marine scientific research in the North Pacific.

433 Mr Geoff Holland, the IOC Chairman, reported as a previous Chairman of the Arctic Ocean Sciences Board (AOSB), that the Board is a non-governmental organization with participation of about twelve countries bordering the Arctic Ocean or having an interest in Arctic marine science. It was established 25 years ago to co-ordinate national and institutional facilities in the implementation of Arctic programmes. It has successfully completed a major study on ocean processes in the Greenland Sea and is currently engaged in an international study of the physical, chemical and biological aspects of Arctic polynyas. In this regard, it is actively searching for partners to hold a comprehensive conference on polynya research including, if possible, Antarctic research results. AOSB also has an active programme to study the past regimes of river flow into the Arctic from an examination of sedimentary deposits - Arctic Paleo River Discharge (APARD). In 1998, the AOSB, with support from NATO and SCOR, held a NATO Advanced Study Workshop on the Freshwater Budget of the Arctic Ocean, with participation of over 50 leading scientists. The papers from the workshop will be published later this year. The AOSB has its Secretariat in the National Science Foundation in Washington DC and its present Chairman is Lief Andersson of Sweden. There is no formal agreement between the AOSB and the IOC, AOSB is, however, willing to co-operate in any Arctic Ocean science matter.

434 The Executive Secretary IOC, Dr Bernal, reported that the Advisory Committee on Protection of the Seas (ACOPS) is receptive to merging efforts with IOC to pursue common goals. Particular interest has been expressed in the follow-up of PACSICOM and the preparation of the Partnership Conference for the African Process scheduled for the year 2001. A Memorandum of Understanding (MOU) between IOC and ACOPS is currently under consideration.

435 **The Assembly noted** this information and **instructed** the Executive Secretary IOC to strengthen and extend bonds of co-operation with regional and global non-governmental and governmental organizations.

10. 1998 INTERNATIONAL YEAR OF THE OCEAN: ACHIEVEMENTS, PROBLEMS AND FUTURE COURSE OF ACTION IN PUBLIC AWARENESS

436 Dr Oliounine, Deputy Executive Secretary IOC and Co-ordinator of the International Year of the Ocean, informed the Assembly of the implementation of the IYO programme as it was accepted by the Nineteenth Session of the IOC Assembly (Document IOC-XIX/2 Annex 3). He referred the Assembly to Document EC-XXXI/13 and to the Annual Report for 1998, where extensive information on IYO initiatives is presented.

437 Dr Oliounine reported on the various efforts made in 1998 by Member States, governmental and non-governmental organizations and the IOC Secretariat in promoting global concerns on ocean use, in raising worldwide awareness of the importance of the oceans for humankind and in increasing international commitment to addressing ocean issues. The list of initiatives included the signing of the Ocean Charter, the development of educational material, the organization of research and training cruises, the publication of proceedings and results of research, the implementation of conferences, several workshops, seminars, cultural and sport events, etc. The development of the IYO Web site and the launching of a world wide public information and the IYO promotion campaign were together an outstanding success of the IOC Secretariat. Detailed information on these and many other activities can be found on the IYO Web site: http://ioc.unesco.org/IYO.

438 Dr Oliounine then drew the attention of the Assembly to the decisions of the Thirty-first Session of the IOC Executive Council and, particularly, to Resolution EC-XXXI.11 on the 1998 International Year of the Ocean.

439 He recalled that during the Thirty-first Session of the Executive Council, on November 23, the entire day was dedicated to the International Year of the Ocean. Events included an official opening of the exhibition, round-table discussions with scientists and representatives of NGOs about the International Year of the Ocean results and follow-up, a Youth Forum, and a press briefing.

440 In response to Resolution EC-XXXI.11, a plan of action was developed as presented in Document IOC-XX/2 Annex 9, *Plan of the International Year of the Ocean Follow-up Action*, which Dr Oliounine presented for comments and adoption.

441 **The Assembly expressed** its appreciation to the IOC Secretariat and its Executive Secretary for the dedication and hard work during the IYO. **It expressed** thanks to the last two Executive Secretaries of IOC for their input to the IYO and to the IOC Chairman for the continuing support to the IYO activities. **The Assembly emphasized** that only through the national, regional and international efforts was it possible to meet the IYO objectives, especially in the area of increasing awareness of the importance of the oceans and the marine environment as resources for sustainable development.

442 Many delegates informed the Assembly of their national activities during the IYO and of the planned follow-up activities, among them the "Wilton Park Conference: Governance of the Oceans" to be held in Wilton Park in December 1999; the Symposium on Coral Reefs to take place in Indonesia in 2000; and many others. The Delegate of Portugal noted the current activities for the establishment of the European Ocean Agency and the creation of the Independent Ocean Observatory to serve the ocean community.

443 **The Assembly acknowledged** the past, present, and future activities of the Member States related to the IYO and, **noting** that the plan of actions contains development of products presenting the efforts of the Member States, both as an achievement and as a platform for future initiatives, **recommended** continuing with the IYO follow-up, with results reported to the next session of the Executive Council.

444 **The Assembly supported** the Plan of Action as presented in Document IOC-XX/2 Annex 9 and **emphasized** that the IOC should promote initiatives in the field of education by establishing partnerships with other sectors of UNESCO and other organizations with expertise in this area. In this connection, the Delegate of Cuba pointed out the importance of both environmental education and public awareness of marine affairs. He also requested IOC co-operation for the continued publication by his country of a special series for children and young people aimed at contributing to their environmental education.

445 **The Assembly agreed** that to a large degree the first objective of the Year of the Ocean - increasing awareness - was achieved successfully and asked that the relationships established with mass media and non-governmental organizations be sustained. **The Assembly requested** its Chairman, jointly with the Executive Secretary IOC, to explore ways of persuading the United Nations to declare an International Ocean Day recognizing that many countries already have National Ocean Days on different calendar days. **The Assembly requested** them to work on the issue jointly with other UN agencies having ocean related activities.

446 Some delegates stressed the need for ocean awards and commemorative medals to be given to scientists and decision-makers for their achievements in promoting ocean research and international co-operation in ocean affairs.

447 **The Assembly applauded** the decision to give a certificate of appreciation to the representatives of NAUSICAA in recognition of their input to the promotion of the IYO.

448 Taking into account the experience gained during the IYO, **the Assembly welcomed** the decision to extend the community of partners by involving industries and navies, and supported the need for a joint conference in 2000.

449 The Chairman supported the decision of approving the Plan of Action and urged the Member States to contribute to the IOC trust fund for implementing agreed upon activities.

450 **The Assembly adopted** Resolution XX-24.

451 **The Assembly agreed** that new opportunities for attracting government support and commitments for ocean research and protection should be explored.

11. IOC ELECTRONIC INFORMATION SERVICES AND PRODUCTS

452 This item was introduced by Mr Peter Pissierssens, Programme Specialist at the IOC Secretariat. In his introduction, Mr Pissierssens gave a historic overview of the IOC Web site development since its inception in 1996. He noted that the number of visitors to the IOC Web site had increased by a factor 10 to an average of 56,000 visits/month in 1999. The IOC main site 'iocweb' receives most of the visits, followed by IYO, IODE, GOOS and IOCARIBE.

453 He pointed out that the IOC does not have a dedicated Web master and that the development and maintenance of the site had been assured either by a staff member or a part-time consultant.

454 With regard to the IOC's electronic library, he informed the Assembly that over 170 IOC publications are now available on-line and that new publications are added constantly. However, the retroactive scanning and conversion of historical documents which started in 1997, had to be stopped due to lack of staff resources. **The Assembly welcomed** the success of the e-Library which had recorded 6,000 document downloads since 1998.

455 With regard to IOC's collaboration with ASFA, Mr Pissierssens reported that the ASFA Advisory Board decided to provide free access to ASFA (over the Internet) for developing countries and that 40 countries in Africa (Low Income and Food Deficit Countries) will receive the ASFA CD-ROM free of charge for a period of at least two years.

456 He highlighted the Global Directory of Marine (and Freshwater) Professionals as an IODE flagship product, and noted that the Directory would reach 10,000 records by September 1999. He pointed out that a management software for GLODIR is available.

457 The Executive Secretary IOC called on the IOC depository Centres to assist the IOC with the retrospective scanning of historical documents. He added that some hardware and software could be provided for this purpose.

458 Several delegates offered their country's co-operation for the retrospective scanning and conversion of historical IOC publications: the Delegate of Cuba offered to investigate the possibility for his country to assist for Spanish language documents; the Delegate of Côte d'Ivoire offered to assist with French language documents.

459 The Delegate of Cuba further pointed out the importance of electronic mail as the most widely used tool available to developing countries. To this end, he requested that the possibility be examined of establishing an e-mail information service on marine affairs in general and the work of the Commission in particular, in addition to the facility available through the IOC homepage.

460 The Delegate of Portugal announced the re-establishment of the Portugal ASFA input centre, and offered document delivery services within the framework of RECOSCIX-CEA for Portuguese language documents. He further informed the Assembly about his country's initiative to set up a national directory of marine science expertise which could contribute to GLODIR. He extended an invitation to the IOC Secretariat, at no expense to the IOC, to visit Lisbon to further discuss possible co-operation between IOC and Portugal with regard to electronic information services.

461 The Delegate of IOI informed the Assembly on the development of the project proposal 'Ocean Net', a comprehensive Web-based information system, which will be submitted to donors shortly, and he suggested collaboration between IOI and IOC in this regard.

462 **The Assembly commended** the IOC Secretariat and particularly Mr P. Pisserssens with the success of its electronic services as a cost-effective means to serve the IOC information needs of the Member States as well as new user communities.

463 **The Assembly noted** that Member States and many IOC programmes including the regional subsidiary bodies were now developing and maintaining their own Web sites and sub-sites with a view to provide a richer, more comprehensive and user-oriented information service to specific scientific target audiences. Member States were requested to inform the IOC Secretariat about their Web sites, and to ensure linkages of national sites to the IOC sites.

464 In order to increase coverage and improve the quality of the product, **the Assembly called on** Member States to identify national (or regional) input centres for GLODIR.

465 With regard to future developments, **the Assembly identified** the need to bring marine science closer to the general public and other communities. **The Assembly called on** Member States to identify these new users, their needs, and the format in which the information should be provided.

466 **The Assembly called on** the Member States to assist the IOC, financially or in-kind, with the further development and maintenance of the IOC Web site, with the further development of the e-Library, with the development of GLODIR, and with the development of electronic information and training tools.

12. PROGRAMME AND BUDGET FOR 2000-2001

467 The Chairman introduced the agenda item by recalling the role of the Assembly to make recommendations and provide technical guidance to the Executive Secretary IOC in the way they wished to have the budget documents prepared. Speaking as the Chairman of the sessional working group on programme and budget, he informed the plenary of the results of the deliberations of the group. The group had requested that the document be shortened and made more pertinent to the expected results of the IOC programme. They requested that some of the more urgent outcomes outlined in the Draft Programme and Budget 30 C/5 document, should be elaborated. The language should be clearly understandable to the audience of the UNESCO General Conference and reflect the wishes of the Assembly. In particular, it was agreed that it was up to the Member States of the Assembly to request additional resources, however, it must be recognized that these same wishes must be reflected in the briefs of national delegations attending the Executive Board and the General Conference of UNESCO.

468 The Executive Secretary IOC presented a table showing the difference between the financial resources expected from the Regular Programme and the financial implications mentioned in the different Draft Resolutions proposed by the Member States. He demonstrated that the total amount of resources represented by the programme discussed during the Assembly goes beyond the total capacity of the projected IOC Budget. He expressed the opinion that requests for projects which require additional funding should be identified prior to the finalization of the proposed budget and then fully incorporated in the preparation of the Draft C/5 and the negotiations with potential donors.

469 During the ensuing debate, delegations emphasized the importance of presenting the budget in a clear and understandable way, with the identification of the priorities and the distribution of resources (Regular Programme and extra-budgetary resources) between different programmes.

470 The Delegate of the USA, supported by other Delegations, suggested that the Draft Resolutions proposed for approval by the Assembly should include the financial implications with an indication of the different sources of funding (Regular Programme, staffing costs, known extra-budgetary contributions and additional funds to be found).

471 **The Assembly urged** its Chairman to send a letter in advance of the UNESCO General Conference to competent national authorities to inform them about the requirements of the IOC programme and budget implementation, in order to obtain their support.

472 **The Assembly adopted** Resolution XX-25 on the IOC budget for the next biennium.

13. ELECTIONS OF THE OFFICERS OF THE COMMISSION AND MEMBERS OF THE EXECUTIVE COUNCIL

473 The Chairman requested the advice of the Assembly on the following situation that, in his opinion, reflected an exceptional circumstance. He explained that following an agreement with the Government of The Netherlands, the Government of Belgium had distributed a *note verbale* to the Permanent Delegations at UNESCO, informing them of its intention to be a candidate for the Executive Council and requesting support as a "Benelux" candidate. Unfortunately, due to a mis-communication, this clear intention was not transmitted to the Nominations Committee before the deadline agreed upon by the Assembly. In the interim, The Netherlands had submitted a

nomination for the position of first Vice-Chairman. Subsequent to discussions with other delegates this nomination was withdrawn and, as allowed for in the Rules of Procedure, The Netherlands was then a legitimate candidate for the Executive Council. It was at this stage, when The Netherlands wished to announce its complete withdrawal in favour of Belgium, that the absence of the Belgian candidacy for the Executive Council was discovered. The Chairman asked the Assembly whether there would be any objection to the acceptance of the late application from Belgium and the withdrawal of The Netherlands, noting that the number of candidates for election would not be increased as the candidacy of one Benelux country would merely be replaced by another.

474 The Chairman of the Nominations Committee thought that such disruptions of the accepted protocol should not be allowed. However no Member State raised an objection. The candidacy of Belgium and the withdrawal of The Netherlands were accepted.

475 **The Assembly noted** the report by the Chairman of the Nominations Committee, indicating that all the nomination forms it had before it were valid and had therefore been forwarded to the Assembly, as Document IOC-XX/NOM-WP.1.

13.1 ELECTION OF THE OFFICERS OF THE COMMISSION

476 **The Assembly noted** that for each of the positions of Chairman, and first and second Vice-chairmen of the Commission, there was only one candidate. These candidates were elected by acclamation. A vote took place for the position of third Vice-chairman, and there was only one candidate for the position of fourth Vice-chairman (after the withdrawal of the failed candidate to the position of third Vice-chairman), who therefore was elected by acclamation.

477 The newly elected Officers of the Commission are:

Chairman:	Dr Su Jilan	China
1st Vice-chairman:	Dr D. T. Pugh	United Kingdom
2nd Vice-chairman:	Mr M. A. Leal	Brazil
3rd Vice-chairman:	Dr S. Khodkin	Russian Federation
4th Vice-chairman:	Dr T. O. Ajayi	Nigeria

13.2 ELECTION OF THE MEMBERS OF THE EXECUTIVE COUNCIL

478 **The Assembly noted** that there were 36 candidates for Member State seats on the Executive Council, whereas the maximum number of those seats was 31, according to article 5.4.(b) of the IOC Statutes. A vote had therefore to take place to elect the Member States sitting on the Executive Council. Thirty seats were filled through the first ballot, but two countries had the same number of votes for the last available seat. A second ballot between those two countries gave the same result. According to Rule of Procedure 47.2: "*If in the second ballot the votes are equally divided, the decision shall be taken by drawing lots.*" The remaining seat on the Executive Council was therefore filled by this process.

479 The composition of the Executive Council, as well as the List of Member States of the Commission, are given in Annex VII.

14. DATES AND PLACE OF THE TWENTY-FIRST ASSEMBLY AND THIRTY-THIRD AND THIRTY-FOURTH SESSIONS OF THE EXECUTIVE COUNCIL; DISCUSSIONS OF THEMES OF THE BRUUN AND PANIKKAR MEMORIAL LECTURES

480 The Chairman reported that the Executive Council had agreed that the Thirty-third Session of the Executive Council should take place in UNESCO starting on Monday May 22, 2000. The Executive Secretary IOC was instructed to keep the meeting as short as practical, but to await the experience gained by the shortened Twentieth Assembly before setting a final date. The Executive Secretary IOC informed the Assembly that a convenient time for the next session of the Assembly at UNESCO was the two week period beginning on July 2, 2001. **The Assembly agreed** that the Twenty-first Assembly should commence on a Tuesday, immediately preceded on the Monday by a Session of the Thirty-fourth Executive Council. However, the Executive Secretary was requested to investigate the possibility of bringing the dates forward by one or two weeks.

481 In response to an invitation from the Chairman to identify possible themes for the Bruun and Panikkar lectures for the next Assembly, three proposals were received for consideration. One dealt with institutional matters ranging from the arrangements within the IOC on the development and use of the regional body network, through the work of the UNCSD on expanding the overall ocean governance of the UN system in dealing with ocean affairs. The two other interventions addressed the scientific subjects of Antarctic marine science and the development of assimilative ocean models respectively.

15. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT

482 Dr Garcia Montero, Co-chairman, presented a report on the work of the Technical Review Committee for Resolutions. He informed the Assembly that the Committee had held 7 sessions and examined up to 30 draft resolutions (DRs). He noted that the participation of appointed Member States to the Committee was minimal, and that wider participation should be guaranteed. He proposed that in the future, the Committee should invite the Member States sponsoring any given DR so as to facilitate the work of the Committee. Finally, he emphasized, that very often the financial implications of DRs was not clear enough and that the preambular parts were too lengthy.

483 He recommended that for future sessions the rules and guidelines described in document IOC/INF-734 rev., should be clearly followed.

484 Several delegates expressed their concern with regards to the length and large number of DRs that were submitted during this session, and as a consequence they felt that the message that the Assembly is trying to carry forward may be diluted.

485 **The Assembly reviewed** the draft resolutions and the draft report. **The Assembly adopted** the resolutions and the report as herein presented.

16. CLOSURE

486 The Chair expressed his satisfaction for the quality of the draft report that greatly facilitated its adoption. He thanked all delegations and the Secretariat in that respect and those behind the scene who contributed to the success of this shortened session.

487 Concluding on his two successive terms of Chairman, he particularly thanked Mr Gunnar Kullenberg and Mr Patricio Bernal, the two Executive Secretaries he worked with. To delegates, he recalled how much he learnt from his office and from their collaboration, among which he pointed out the virtue of listening to reach a consensus.

488 The delegates of France, India, Cuba, Norway, Japan and the representative of the Organization of African Unity expressed, on behalf of the Assembly, their appreciation and thanks to the IOC Chairman, for his leadership, his calm attitude and humour and his wide overview of Ocean affairs that guided the Commission into a new era of oceanography.

489 The chair expressed gratitude to his colleagues and friends, and closed the Twentieth Session of the IOC Assembly at 13.05 on 9 July 1999.

ANNEX I

AGENDA

1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SESSION
1.2 BRUUN AND PANIKKAR MEMORIAL LECTURES
1.3 ADOPTION OF THE AGENDA
1.4 DESIGNATION OF THE RAPPORTEUR
1.5 ESTABLISHMENT OF INTRASESSIONAL COMMITTEES
1.6 INTRODUCTION OF TIMETABLE AND DOCUMENTATION

2. REPORTS

2.1 REPORT OF THE EXECUTIVE SECRETARY ON INTERSESSIONAL ACTIVITIES: 1997 - 1998
2.2 PROGRESS REPORT ON THE BUDGET EXECUTION
2.3 INTRODUCTION OF THE PROGRAMME AND BUDGET FOR 2000 - 2001
2.4 REPORT OF THE *AD HOC* STUDY GROUP ON IOC DEVELOPMENTS, OPERATIONS, STRUCTURE AND STATUTES

3. OCEAN SCIENCES

3.1 OCEANS AND CLIMATE, OCEANS AND GLOBAL CHANGE
3.2 ICAM AND OTHER COASTAL ZONE PROGRAMMES, INCLUDING OSNLR
3.3 MARINE POLLUTION RESEARCH AND MONITORING
3.4 OCEAN SCIENCE IN RELATION TO LIVING RESOURCES

4. OCEAN SERVICES

4.1 DATA AND MARINE INFORMATION MANAGEMENT
4.2 OCEAN MAPPING
4.3 IDNDR-RELATED ACTIVITIES: STORM SURGES, EL NIÑO

5. OPERATIONAL OBSERVING SYSTEM

5.1 GOOS
5.2 GCOS
5.3 OPERATING SYSTEMS: IGOSS, GLOSS, DBCP, GCRMN, SATELLITES
5.4 JCOMM

6. REGIONAL ACTIVITIES

6.1 REPORTS OF CHAIRMEN OF REGIONAL SUBSIDIARY BODIES
6.2 AFRICAN AGENDA

7. CAPACITY BUILDING IN MARINE SCIENCES, SERVICES AND OBSERVATIONS: TEMA

8. EVOLUTION OF THE IOC AS AN INTEGRAL PART OF UNESCO: RESULTS OF THE 29th GENERAL CONFERENCE AND 156th EXECUTIVE BOARD OF UNESCO

9. CO-OPERATION WITH THE UN AND OTHER INTERNATIONAL ORGANIZATIONS

9.1 CO-OPERATION WITH UN ORGANIZATIONS
9.2 FOLLOW-UP TO UNCED, INTERNATIONAL OCEAN ASSESSMENTS
9.3 IOC AND UNCLOS
9.4 PROGRESS IN IMPLEMENTING DECISIONS OF THE INTERNATIONAL CONFERENCE ON SMALL ISLANDS DEVELOPING STATES
9.5 CO-OPERATION WITH THE EUROPEAN UNION
9.6 CO-OPERATION WITH ICSU

10. 1998 INTERNATIONAL YEAR OF THE OCEAN: ACHIEVEMENTS, PROBLEMS AND WHAT NEXT?

11. IOC ELECTRONIC INFORMATION SERVICES AND PRODUCTS

12. PROGRAMMES AND BUDGET FOR 2000 - 2001

13. ELECTIONS OF THE OFFICERS OF THE COMMISSION AND MEMBERS OF THE EXECUTIVE COUNCIL

14. DATES AND PLACE OF THE TWENTY-FIRST ASSEMBLY AND THIRTY-THIRD AND THIRTY-FOURTH SESSIONS OF THE EXECUTIVE COUNCIL; DISCUSSIONS OF THEMES OF THE BRUUN AND PANIKKAR MEMORIAL LECTURES

15. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT

16. CLOSURE

ANNEX II

ADOPTED RESOLUTIONS

Resolution XX-1

STATUTES OF THE COMMISSION

The Intergovernmental Oceanographic Commission,

Recalling Resolution XVIII-1, by which the IOC Assembly decided to continue the work of the *ad hoc* Study Group on IOC Development, Operations, Structure and Statutes (DOSS-2) with revised composition and terms of reference,

Recalling further Resolution XIX-15 of the IOC Assembly in which the final report of the *ad hoc* Study Group and the recommendations of the Thirty-first Session of the Executive Council are to be provided to the Twentieth Session of the IOC Assembly,

Bearing in mind Resolution EC-XXXI.14 of the IOC Executive Council on the Progress Report of the *ad hoc* Study Group on IOC Development, Operations, Structure and Statutes (DOSS-2),

Bearing in mind further Decision 156 EX/SR.14 of the 156th Session of the Executive Board of UNESCO, (1999), inviting the Director-General to present to its 157th Session the modified Statutes of the Commission,

Having considered Document IOC-XX/2 Annex 2, the report and recommendations proposed by the *ad hoc* Study Group and the Sessional Open-Ended Working Group on the DOSS-2,

Approves the proposed amendments to the IOC Statutes contained in the Annex to this Resolution;

Instructs the Executive Secretary IOC to transmit the proposed amendments to the Statutes to the Director-General of UNESCO for consideration of the 30th General Conference;

Recommends to the General Conference of UNESCO to amend the Commission's Statutes in accordance with the text contained in the Annex to this Resolution;

Annex to Resolution XX-1

Proposed Statutes of the Commission

Article 1: The Commission

1. The Intergovernmental Oceanographic Commission, hereafter called the Commission, is established as a body with functional autonomy within the United Nations Educational, Scientific and Cultural Organization (UNESCO).

2. The Commission defines and implements its programme according to its stated purposes and functions and within the framework of the budget adopted of its Assembly and the General Conference of UNESCO.

Article 2: Purpose of the Commission

1. The purpose of the Commission is to promote international co-operation and to co-ordinate

programmes in research, services and capacity building, in order to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and the decision-making processes of its Member States.

2. The Commission will collaborate with international organizations concerned with the work of the Commission, and specially with those organizations of the United Nations system, which are willing and prepared to contribute to the purpose and functions of the Commission and/or to seek advise and co-operation in the field of ocean and coastal area scientific research, related services and capacity building.

Article 3: Functions

1. The functions of the Commission shall be to:

   (a) recommend, promote, plan and co-ordinate international ocean and coastal area programmes in research, observations and dissemination and use of their results;

   (b) recommend, promote and co-ordinate the development of relevant standards, reference materials, guidelines and nomenclature;

   (c) respond, as a competent international organization, to the requirements deriving from the United Nations Convention of the Law of the Sea (UNCLOS), the United Nations Conference on Environment and Development (UNCED), and other international instruments relevant to marine scientific research, related services and capacity building;

   (d) make recommendations and co-ordinate programmes in education, training and assistance in marine science, ocean and coastal observations and the transfer of related technology;

   (e) make recommendations and provide technical guidance to relevant intersectorial activities of UNESCO and undertake mutually agreed duties within the mandate of the Commission;

   (f) undertake, as appropriate, any other action compatible with its purpose and functions.

2. The Commission shall prepare regular reports on its activities, which shall be submitted to the General Conference of UNESCO. These reports shall also be addressed to the Member States of the Commission as well as to the organizations within the United Nations system covered by paragraph 2 of article 2.

3. The Commission shall decide upon the mechanisms and arrangements through which it may obtain advice.

4. The Commission, in carrying out its functions, shall take into account the special needs and interests of developing countries, including in particular the need to further the capabilities of these countries in scientific research and observations of the oceans and coastal areas and related technology.

5. Nothing in these Statutes shall imply the adoption of a position by the Commission regarding the nature or extent of the jurisdiction of coastal States in general or of any coastal State in particular.

Article 4: Membership

A. Membership

1. Membership of the Commission shall be open to any Member State of any one of the organizations of the United Nations system.

2. States covered by the terms of paragraph 1 above shall acquire membership of the Commission by notifying the Director-General of UNESCO.

3. Any Member State of the Commission can withdraw by giving notice of its intention to do so to the Director-General of UNESCO.

4. The Director-General of UNESCO shall inform the Executive Secretary of the Commission of all notifications received under the present Article. Membership will take effect from the date on which the notification is received by the Executive Secretary. Notice of withdrawal will take effect one full year after the date on which the notice is received by the Executive Secretary, through the Director-General of UNESCO. The Executive Secretary will inform Member States of the Commission and the Executive Heads of the relevant United Nations organizations of all notifications.

B. Responsibilities of Member States

5. The responsibilities of Member States imply:

   (i) compliance with the Statutes and Rules of Procedure of the Commission;

   (ii) collaboration with and support of the programme of work of the Commission;

   (iii) specification of the national co-ordinating body for liaison with the Commission;

   (iv) support of the Commission at an appropriate level using any or all of the financial mechanisms listed under Article 10.

6. The notification by a Member State requesting membership shall include a statement indicating acceptance of the above responsibilities or its intention to comply at an early date.

Article 5: Organs

The Commission shall consist of an Assembly, an Executive Council, a Secretariat and such subsidiary bodies it may establish.

Article 6: The Assembly

A. Composition

1. The Assembly shall consist of all States Members of the Commission.

B. Functions and Powers

2. The Assembly is the principal organ of the Commission and shall perform all functions of the Commission unless otherwise regulated by these Statutes or delegated by the Assembly to other organs of the Commission.

3. The Assembly shall determine the Commission's Rules of Procedure.

4. The Assembly shall establish general policy and the main lines of work of the Commission, and shall approve the IOC Biennial Draft Programme and Budget in accordance with paragraph 2 of Article 1.

5. During the course of each ordinary session, the Assembly shall elect a Chairperson and, taking into account the principles of geographic distribution, shall elect five Vice-Chairpersons who shall be the officers of the Commission, its Assembly and its Executive Council, and shall also elect a number of Member States to the Executive Council in accordance with Article 7.

6. In electing Member States to the Executive Council, the Assembly shall take into consideration a balanced geographical distribution, as well as their willingness to participate in the work of the Executive Council.

C. Procedure

7. The Assembly shall be convened in ordinary session every two years.

8. Extraordinary sessions may be convened if so decided or if summoned by the Executive Council, or at the request of at least one-third of the Member States of the Commission under conditions specified in the Rules of Procedure.

9. Each Member State shall have one vote and may send to sessions of the Assembly such representatives, alternates and advisers, as it deems necessary.

10. Subject to provisions in the Rules of Procedure regarding closed meetings, participation in the meetings of the Assembly, of the Executive Council and subsidiary bodies, without the right to vote, is open to:

    (a) representatives of Member States of organizations of the United Nations system which are not members of the Commission;

    (b) representatives of the organizations of the United Nations system;

(c) representatives of such other intergovernmental and non-governmental organizations as may be invited subject to conditions specified in the Rules of Procedure.

11. The Assembly may set up committees or other subsidiary bodies as may be necessary for its purpose, in accordance with conditions specified in the Rules of Procedure.

Article 7: The Executive Council

A. Composition

1. The Executive Council shall consist of up to 40 Member States, including those Member States represented by the Chairperson and the five Vice-Chairpersons.

2. The mandate of the Members of the Executive Council shall commence at the end of the session of the Assembly during which they have been elected and expire at the end of the next session of the Assembly.

3. In selecting representatives to the Executive Council, Member States elected to the Executive Council shall endeavour to appoint persons experienced in matters related to the Commission.

4. In the event of the withdrawal from the Commission of a Member State that is Member of the Executive Council, its mandate shall be terminated on the date the withdrawal becomes effective.

5. Members of the Executive Council are eligible for re-election.

B. Functions and Powers

6. The Executive Council shall exercise the responsibilities delegated to it by the Assembly and act on its behalf in the implementation of decisions of the Assembly.

7. The Executive Council may set up committees or other subsidiary bodies as may be necessary for its purpose, in accordance with conditions specified in the Rules of Procedure.

C. Procedure

8. The Executive Council shall hold ordinary and extraordinary sessions as specified in the Rules of Procedure.

9. At its meetings, each Member State of the Executive Council shall have one vote.

10. The agenda of the Executive Council should be organized as specified in the Rules of Procedure.

11. The Executive Council shall make recommendations on future actions by the Assembly.

Article 8: The Secretariat

1. With due regard to the applicable Staff Regulations and Rules of UNESCO, the Secretariat of the Commission shall consist of the Executive Secretary and such other staff as may be necessary, provided by UNESCO, as well as such personnel as may be provided, at their expense, by other Organizations, the United Nations system, and by Member States of the Commission.

2. The Executive Secretary of the Commission, at the level of Assistant Director-General, shall be appointed by the Director-General of UNESCO following consultation with the Executive Council of the Commission.

Article 9: Committees and Other Subsidiary Bodies

1. The Commission may create, for the examination and execution of specific activities, subsidiary bodies composed of Member States or individual experts, after consultation with the Member States concerned.

2. To further the co-operation referred to in Article 11, other subsidiary bodies composed of Member States or individuals may also be established or convened by the Commission jointly with other organizations. The inclusion of individuals in such subsidiary bodies would be subject to consultations with the Member States concerned.

Article 10: Financial and Other Resources

1. The financial resources of the Commission shall consist of:

   (i) funds appropriated for this purpose by the General Conference of UNESCO;

   (ii) contributions by Member States of the Commission, that are not Member States of UNESCO;

   (iii) additional resources as may be made available by Member States of the Commission, appropriate organizations of the United Nations system and from other sources.

2. The programmes or activities sponsored and co-ordinated by the Commission and recommended to its Member States for their concerted action shall be carried out with the aid of the resources of the participating Member States in such programmes or activities, in accordance with the obligations that each State is willing to assume.

3. Voluntary contributions may be accepted and established as trust funds in accordance with the financial regulations of the Special Account of the IOC, as adopted by the Assembly and UNESCO. Such contributions shall be allocated by the Commission for its programme of activities.

4. The Commission can establish, promote or co-ordinate, as appropriate, additional financial arrangements to ensure the implementation of an effective and continuing programme at global and/or regional levels.

Article 11: Relations with Other Organizations

1. The Commission may co-operate with specialized agencies of the United Nations and other international organizations whose interests and activities are related to its purpose, including signing memoranda of understating with regard to co-operation.

2. The Commission shall give due attention to supporting the objectives of international organizations with which it collaborates. On the other hand, the Commission shall request these organizations to take its requirements into account in planning and executing their own programmes.

3. The Commission may act also as a joint specialized mechanism of the organizations of the United Nations system that have agreed to use the Commission for discharging certain of their responsibilities in the fields of marine sciences and ocean services, and have agreed accordingly to sustain the work of the Commission.

Article 12: Amendments

The General Conference of UNESCO may amend these Statutes following a recommendation of, or after consultation with, the Assembly of the Commission. Unless otherwise provided by the General Conference, an amendment of these Statutes shall enter into force on the date of its adoption by the General Conference.

Resolution XX-2

MEASUREMENT AND MANAGEMENT OF SUBMARINE GROUNDWATER DISCHARGE IN THE COASTAL ZONE AS A CONTRIBUTION TO THE IOC/ICAM PROGRAMME

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIX-5 of the IOC Assembly to establish an Integrated Coastal Area Management Programme (ICAM) and to invite Member States to initiate new co-operation projects,

Noting that the flow of groundwater directly to the sea, or submarine groundwater discharge (SGD) is an important component in marine geochemical budgets and may influence ecosystems within the coastal zone,

Emphasizing that the proposed project has important links to ICAM, IOC Marine Science programmes such as OSLR, OSLNR, GIPME and the coastal component of GOOS,

Takes note that the measurement of the SGD process has proven very difficult, and has hampered the scientific understanding of this process;

Instructs the Executive Secretary IOC to convene a group of experts with the following terms of reference:

(i) to draft a basic plan for a SGD Project in the context of ICAM in close collaboration with LOICZ, the GOOS Coastal Panel, the UNESCO International Hydrological Programme and Programme on Environment and Development in Coastal Regions and Small Islands, and SCOR / LOICZ WG-112;

(ii) to prepare an intercalibration programme to resolve existing measurement problems and develop new techniques as appropriate; and

(iii) to report progress to the Thirty-third Session of the IOC Executive Council and submit the draft plan and programme to the Twenty-first Session of the IOC Assembly.

Financial implications: US$15,000 from Extra-budgetary Sources

Resolution XX-3

THE HARMFUL ALGAL BLOOM (HAB) PROGRAMME

The Intergovernmental Oceanographic Commission,

Recalling:

(i) Resolution XVII-2 of the IOC Assembly on the establishment of IOC Science and Communication Centres on Harmful Algae,

(ii) the establishment by Denmark and Spain of IOC Science and Communication Centres on Harmful Algae, and the support of Japan to WESTPAC/HAB, as contributions to the implementation of the IOC HAB Programme,

Noting:

(i) the present agreement to continue the Centre in Spain until the end of 2001 and the original agreement for the Centre in Denmark until end of 1999,
(ii) the successful co-operation between the IOC, the national resource-bases, and donors in the implementation of elements of the IOC Programme, and its value as examples of active multi-lateralism by Member States,

Considering:

(i) the significant and growing impacts of harmful algal blooms on human health and fisheries resources throughout the world,

(ii) the continued demand for training and capacity building in research and systematic observations of HABs in many parts of the world,

Recognizing with appreciation:

(i) the importance of the IOC Science and Communication Centres to the capability of the IOC to implement in particular the training and capacity building component of the IOC HAB Programme,

(ii) the significant support to the training and capacity building element of the HAB Programme provided in particular by the Danish, Spanish and Japanese partners,

Reaffirms that the IOC should continue its support for the further planning, development and implementation of the Harmful Algal Bloom Programme;

Urges Member States to continue to take active responsibility for the implementation of the IOC HAB Programme through scientific and financial support;

Instructs the Executive Secretary IOC, within available budgetary resources, to work for the continuation of the IOC Science and Communication Centres in co-operation with the relevant Member States, and to provide the required administrative back-up for the Centres to operate efficiently.

Financial implications: US$40,000 from Regular Programme

Resolution XX-4

INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE SYSTEM (IODE)

The Intergovernmental Oceanographic Commission,

Acknowledging:

(i) the achievements of the IOC in establishing a comprehensive ocean data and information management system supporting national, regional and global activities,

(ii) the efforts of the IODE system, e.g. through the GTSPP to include operational data in its scope,

Recognizing:

(i) the important role of the IODE programme in spear-heading the use of new technologies for the dissemination of data and information to the user communities,

(ii) the efforts of IODE in the areas of data quality control, data and information standards, formats and data and information archival,

Recognizing with appreciation the substantial and long-standing investments and efforts made by Member States in establishing, maintaining and operating the IODE system since its establishment in 1961,

Noting the progress in developing the mechanisms for operational data management,

Noting with concern the continuing reduction in staff support for IODE at the IOC Secretariat, which will soon reach a level at which the effective implementation of the full programme can no longer be guaranteed,

Instructs the Executive Secretary IOC and the Chairs of relevant IOC programmes with marine data and information components, to take necessary measures to ensure co-ordination and integration of their data and information management activities;

Instructs further the Executive Secretary IOC to ensure that IODE be sufficiently staffed in order to safeguard the future successful development and maintenance of the IODE programme;

Requests the IODE to work in concert with JCOMM and GOOS in the development of a comprehensive ocean data management system;

Urges Member States:

(i) to continue and strengthen support for IODE:

- at the national level, through the establishment and support of NODCs, DNAs, RNODCs or WDCs-Oceanography;

- at the Secretariat level, through support to the IOC Trust Fund and/or through secondment of staff;

(ii) to utilize the IODE system's comprehensive facilities and mechanism for new or developing data and information service and product programmes and projects;

(iii) to ensure co-ordination and integration with/within IOC, of programmes with a marine data and information management component;

(iv) to ensure co-ordination and compatibility between IODE formats and standards and those proposed or utilized by new or developing data and information service and product programmes and projects.

Financial implications: US$300,000 (US$200,000 from Regular Programme)
(US$100,000 from Trust Fund)

Resolution XX-5

OCEAN MAPPING

The Intergovernmental Oceanographic Commission,

Recalling that Ocean Mapping is a matter of high importance to all IOC Member States as well as to global and regional science and service programmes, such as climate programmes, ICAM, tsunamis and storm surges,

Noting with satisfaction:

(i) that, in accordance with Resolution XIX.3 of the IOC Assembly, the Joint IOC-IASC-IHO Editorial Board for the International Bathymetric Chart of the Arctic Ocean (IBCAO) has been established and held its inaugural meeting in the Royal Danish Administration of Navigation and Hydrography in Copenhagen, Denmark, 19-20 October 1998,

(ii) the close co-operation in Ocean Mapping with the International Hydrographic Organization (IHO) and the progress made in Ocean Mapping due to the efficient co-operation of the IOC Consultative Group on Ocean Mapping (CGOM) with the Editorial Boards for the International Bathymetric Charts for six selected areas of the World Ocean, of which the Arctic Ocean is the most recent,

Takes note of:

(i) the Report of the Seventh Session of the Consultative Group on Ocean Mapping (CGOM), which met in the International Hydrographic Bureau in Monaco, 12-14 April 1999;

(ii) the comprehensive Report of the Consultative Group on Ocean Mapping (CGOM) which was submitted to the Twentieth Session of the Assembly in accordance with Clause 1 of its Terms of Reference;

Considering the international co-operative aims of Agenda 21 and in recognition of the demands of the Ocean Scientific Community for seamless gridded data sets embracing deep ocean and continental margin data,

Invites Member States**:**

(i) to provide assistance to the Centenary Conference for the General Bathymetric Chart of the Ocean (GEBCO), to be held in Monaco in the year 2003;

(ii) to assist developing countries, at their request, in the exploration and protection of their Exclusive Economic Zones (EEZs) in providing technical assistance, or assisting in the production of large-scale bathymetric charts for areas of particular interest such as coastal zones and near-shore shelf areas;

(iii) to give increased support to TEMA and capacity building in Ocean Mapping in national and regional programmes, for instance by offering shipborne and land-based courses for professional and student trainees of developing countries; and

Instructs the Executive Secretary IOC to support the United Nations' initiative to publish the UN Atlas under the auspices of the ACC Sub-Committee on Oceans and Coastal Areas.

Financial implications for 2000-2001:

- Participation of Ocean Mapping officers, staff and experts in relevant activities of Ocean Mapping and other programmes and organizations in 2000-2001 : US$ 25,000
- Biennial cycle of meetings of the IOC Consultative Group on Ocean Mapping and GEBCO Guiding Committee in 2001: US$ 25,000
- Meetings of the Editorial Boards for the biennial cycle: IBCM, IBCWIO, IBCCA, IBCEA, IBCWP, IBCAO: US$ 115,000
- Contracts for the organizations of related Ocean Mapping activities: US$ 80,000

Total required: US$245,000 (US$50,000 from Regular Programme)
(US$195,000 from Extra-budgetary Sources)

Resolution XX-6

THE *Argo* PROJECT

The Intergovernmental Oceanographic Commission,

Considering that:

(i) the Global Ocean Data Assimilation Experiment (GODAE) is being planned as a pilot project in the context of the UN-sponsored programmes of GOOS, GCOS and CLIVAR, to contribute to short-term ocean forecasting, to provide boundary conditions for forecasting in coastal seas, and to contribute to seasonal to inter-annual atmospheric forecasts,

(ii) GODAE will meet the pressing need for: (a) a vastly improved co-operation and integration of remote and *in situ* data streams, and (b) improved ocean models and data assimilation techniques to exploit this information, to meet various kinds of user's requirements, such as the stated requirements of the Conference of Parties to the Framework Convention on Climate Change for observational data to support its needs for monitoring and assessing climate change and its impacts,

(iii) a major focus of the International GODAE Steering Team has been the development of a proposal for a global array of about 3,000 profiling floats, now known as the *Argo* project, which will be deployed in open ocean waters to cover the global ocean, and will measure temperature and salinity profiles in the upper 2,000 metres of the water column,

(iv) the data and data products derived from those floats will be freely available in real-time and delayed mode through IOC and WMO data exchange systems, as well as other appropriate

international mechanisms, and will support operational oceanography and marine meteorology,

(v) those profiling floats are measuring instruments using modern technology; they drift freely at depths as great as 2,000 metres, rising to the surface every week or two to transmit data to shore *via* satellite,

Considering further that the *Argo* project shall be fully consistent with UNCLOS,

Noting the absence of a specific international legal instrument regulating profiling floats, drifting buoys, and other similar objects deployed in the oceans,

Recognizing that:

(i) just as with existing surface drifting buoys, some of these new instruments may drift into waters under national jurisdiction,

(ii) the *Argo* project is operational, is now being implemented, but is not yet global,

Strongly supporting the objectives and activities of GODAE which, as part of GOOS and GCOS, enjoys co-sponsorship by IOC, WMO, UNEP and ICSU,

Noting that the *Argo* project presents an excellent opportunity to improve ocean and climate forecasting, with consequent benefits for the protection of life and property and effective planning for the effects of seasonal to inter-annual climate variability,

Acknowledging paragraph 3.4.4.26 of the general summary of the Thirteenth World Meteorological Congress, which specifically addresses and endorses the *Argo* project,

Recognizing the need to ensure that Member States gain maximum benefit from the data of the *Argo* project in real-time and at longer time scales, and that they have the possibility to participate in and contribute to the project,

Accepts the *Argo* project as an important contribution to the operational ocean observing system of GOOS and GCOS, as well as a major contribution to CLIVAR and other scientific research programmes;

Concludes that concerned coastal States must be informed in advance, through appropriate channels, of all deployments of profiling floats which might drift into waters under their jurisdiction, indicating the exact locations of such deployments;

Instructs the Executive Secretary IOC, in close collaboration with the Secretary-General of WMO and in consultation with the Executive Director of UNEP:

(i) to inform all Member States, the IHO, and appropriate UN agencies, including IMO and FAO, of the acceptance of the *Argo* project by IOC and WMO;

(ii) to inform all Member States how to determine float locations and access float data;

(iii) to consider how all Member States might participate in and benefit from the *Argo* project, as well as propose options to that end; and

(iv) to appeal for international co-operation in making the *Argo* project a success;

Further instructs the Executive Secretary IOC to consult with the ABE-LOS and JCOMM on the legal and technical implications respectively of the deployment of profiling floats, drifting buoys, and other similar objects in the ocean, including the feasibility of drafting a legal instrument.

Financial implications: none

Resolution XX-7

THE GLOBAL OCEAN OBSERVING SYSTEM (GOOS)

The Intergovernmental Oceanographic Commission,

Recalling:

(i) that the development of a Global Ocean Observing System (GOOS) was recommended by the Second World Climate Conference (Geneva, 1990), as a means of monitoring and forecasting global change, and by the United Nations Conference on Environment and Development (UNCED) (Rio, 1992), as a means of providing information on the state and future condition of the seas and oceans to support sustainable development, especially of Exclusive Economic Zones,

(ii) IOC Resolution XVI-8 of the Assembly and WMO Resolution 9 (Cg-11) of the Congress by which it was decided to undertake the development of a Global Ocean Observing System,

(iii) that the third Conference of the Parties to the Framework Convention on the Climate Change (FCCC, Kyoto, 1997) re-confirmed the need for a long-term operational GOOS, stating:

(a) *that continued unrestricted use of the ocean by mankind is inconsistent with long-term preservation of sustainability and quality of its resources,*

(b) *that the ocean processes that are critical to global changes are themselves subject to man-induced global climate change,*

(c) *that no significant decision addressing these realities in economically and politically beneficent ways for governments, industry, science and the general public can be achieved without a basic knowledge of ocean processes and variability*,

(d) *that scientific efforts (TOGA, WOCE, etc.) in the last two decades have fully demonstrated that this basic knowledge cannot be achieved, and therefore no applications developed, without systematic observations at global scale*,

Noting the progress achieved in GOOS design and planning, expressed *inter alia* through the issuing of various publications such as *Towards Operational Oceanography: The Global Ocean Observing System*, *The Strategic Plan and Principles for the Global Ocean Observing System*, *The Global Ocean Observing System 1998 - A Prospectus*, etc.,

Recognizing that, at this stage of development, the specification of GOOS has not been formally agreed by governments,

Recognizing further that:

(i) specific implementation plans are now being developed for different components of GOOS,

(ii) the implementation and maintenance of GOOS, on the basis of these plans, can only be achieved through specific contributions from governments,

(iii) these contributions shall take advantage of existing *in situ* and space-based ocean observation systems, which are able to contribute to GOOS development,

Reiterates and reinforces its decision to establish, develop and maintain, through the concerted action of its Member States, an internationally co-ordinated Global Ocean Observing System;

Agrees that the concept of GOOS as defined in the aforementioned publications is a realistic and achievable means of combining and enhancing the marine observing systems of the world into an integrated, operationally functioning system;

Endorses the Principles of Design and Involvement defined in the *Strategic Plan and Principles for the Global Ocean Observing System* as an appropriate definition of the essential features of activities contributing to GOOS and the implications of participation;

Specifies in addition that GOOS shall provide the infrastructure necessary to assess the present and forecast the future states of seas and oceans and their living resources, in support of their sustainable use, as well as to contribute to the prediction of climate change and variability; in particular, it shall:

(i) specify in terms of space, time, quality and other relevant factors, the marine observational data needed on a continuing basis to meet the common and identifiable requirements of the user communities;

(ii) cover the global ocean and its coupling with the near-surface atmosphere, polar ice and land boundaries;

(iii) encourage and support the development and application of now-casting and forecasting capabilities as a means of monitoring climate changes, preserving healthy coastal environments, promoting sustainable uses of coastal resources, mitigating coastal hazards, and ensuring safe and efficient marine operations;

(iv) encourage and support technical developments for long-term, low-cost, *in situ* ocean observing systems and products;

(v) co-ordinate international mechanisms for acquiring, integrating and distributing observations;

(vi) promote and support initiatives for generating and operationally disseminating analysis, forecasts and other products, as required by the user communities;

(vii) in particular, support the implementation and monitoring of the Conventions on Climate Change, Biodiversity and Desertification;

(viii) involve and integrate existing international and regional mechanisms already working on ocean observation;

(ix) facilitate means by which less-developed Member States can increase their capacity to acquire and use marine data according to the GOOS framework;

(x) be developed in accordance with the published GOOS principles and strategy;

(xi) co-ordinate its development with those similar systems already in place or under development, mainly the World Weather Watch (WWW) of WMO, the Global Climate Observing System (GCOS) and the Global Terrestrial Observing System (GTOS);

Encourages the numerous efforts that are being made, at the national, regional and global levels, towards implementing GOOS, including:

(i) those that are aimed at streamlining the activities of existing operational systems and/or bodies such as the WMO Commission for Marine Meteorology (CMM) and its Voluntary Observing Ships (VOS) scheme, the IOC-WMO Integrated Global Ocean Services System (IGOSS) and its Ship-of-Opportunity Programme (SOOP), the IGOSS-IODE Global Temperature and Salinity Profile Programme (GTSPP), the WMO-IOC Data Buoy Co-operation Panel (DBCP), the IOC Global Sea-Level Observing System (GLOSS), the Tropical Atmosphere Ocean (TAO) array in the Pacific Ocean;

(ii) those that contribute to understanding more precisely what are the GOOS requirements and possible output, such as the Pilot Research Moored Array in the Tropical Atlantic (PIRATA), the Global Ocean Data Assimilation Experiment (GODAE), etc.;

(iii) those that constitute direct regional contributions to GOOS, such as the European GOOS (EuroGOOS), the North-East Asian Regional GOOS (NEAR-GOOS), the Mediterranean GOOS (MedGOOS) and other similar initiatives that are being planned; and

(iv) the co-ordination of major space agencies for the development and operation of permanent space-based ocean observing systems;

Urges Member States to contribute to GOOS implementation within the context of available resources and government policies, and in particular to:

(i) make specific commitments to implement and maintain components of GOOS as defined in the GOOS implementation plans;

(ii) exchange data and products through available marine data, collection and management services of IOC and WMO wherever possible, account being taken of national regulations, in accordance with policies and mechanisms of ocean data management and as agreed by the GOOS sponsoring organizations;

(iii) co-operate with and assist other Member States, both to implement and maintain GOOS and also to share in the benefits to be derived from GOOS;

(iv) contribute where possible to GOOS co-ordination and management through support for the work of the GOOS Project Office;

Invites WMO, UNEP and ICSU to continue and expand their support for GOOS implementation, as well as FAO to consider assisting in GOOS development through relevant technical contributions and the eventual co-sponsorship of the System;

Instructs the Executive Secretary IOC, in consultation with the Secretary-General of WMO and the Executive Directors of UNEP and ICSU, with the assistance of I-GOOS and within the available budgetary resources, to:

(i) manage the co-ordination of GOOS implementation;

(ii) assist Member States in the implementation of this Resolution.

Financial implications: none

Resolution XX-8

REVISED TERMS OF REFERENCE FOR I-GOOS

The Intergovernmental Oceanographic Commission,

Noting:

(i) Resolutions I-GOOS-III.1 and 2 endorsing GOOS principles and strategic plan respectively,

(ii) Resolution I-GOOS-III.4 endorsing the formation of the GOOS Steering Committee (GSC) and approving the terms of reference of the GSC provided in the Annex to the Resolution,

Approves the amended I-GOOS Terms of Reference as follows:

I-GOOS is the intergovernmental body taking overall responsibility for promotion, co-ordination, implementation and management of the Global Ocean Observing System (GOOS), according to the agreed principles and strategy. Therefore, I-GOOS will:

(i) regularly assess user requirements;

(ii) approve overall plans for the initiation and implementation stages of GOOS elements;

(iii) facilitate the development of such plans on the advice of the GOOS Steering Committee, its Scientific and Technical Advisory Panels and other scientific and technical groups as appropriate;

(iv) identify the resources needed for GOOS and the means for obtaining them;

(v) monitor the progress of GOOS and propose changes as required;

(vi) provide guidance to the Director of GPO on priority needs for GOOS development and implementation;

(vii) be responsible for the representation of GOOS at intergovernmental meetings.

For implementing these activities, the Committee is invited to:

(i) develop and maintain a strategy for providing training and technical assistance within the TEMA framework;

(ii) develop and maintain working relations with relevant bodies of other UN organizations, with other intergovernmental and regional bodies such as ICES and non-governmental bodies, notably ICSU and its SCOR;

(iii) build upon bodies responsible for the various existing programmes and activities such as IGOSS, DBCP, GLOSS (subject to their eventual incorporation in JCOMM) and GIPME/MARPOLMON;

(iv) support and promote regional development of GOOS.

Financial implications: none

Resolution XX-9

THE INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES)

The Intergovernmental Oceanographic Commission,

Recognizing that:

(i) the International Council for the Exploration of the Sea (ICES) has a Steering Group for GOOS,

(ii) co-operation between GOOS and ICES would be beneficial to both organizations,

Offers to co-sponsor the ICES Steering Group for GOOS, and to appoint representatives to it as appropriate;

Instructs the Executive Secretary IOC to convey this offer to the Secretary-General of ICES.

Financial implications: US$5,000 from Trust Fund

Resolution XX-10

THE PERMANENT COMMISSION FOR THE SOUTH PACIFIC (CPPS)

The Intergovernmental Oceanographic Commission,

Recognizing that:

(i) the Permanent Commission for the South Pacific (CPPS) has been identified by IOC and WMO as the central unit for co-ordinating South East Pacific observational activities,

(ii) increased co-operation between IOC and CPPS would be beneficial to both organizations, particularly within the scope of the GOOS programme,

Decides to explore the possibility that the CPPS agreement with IOC be complemented by a special arrangement, specifying the contribution of CPPS to GOOS development, including national CPPS contributions;

Instructs the Executive Secretary IOC to pursue the drafting of such an arrangement with the CPPS Secretariat.

Financial implications: none

Resolution XX-11

OCEANOGRAPHIC DATA EXCHANGE POLICY

The Intergovernmental Oceanographic Commission,

Noting :

(i) the agreements on the broad principles of global data management already reached by the Sponsors Forum for the global observing systems, comprising IOC, UNESCO, UNEP,

WMO, FAO and ICSU, and by the Integrated Global Observing Strategy (IGOS) Partners, which includes those same bodies plus CEOS, WCRP, IGBP and IGFA,

(ii) the existing data management and exchange agreements set forth by the conventions for the protection of the marine environment, such as OSPAR, HELCOM or the Barcelona Convention,

(iii) the existing broad agreements relating to data relevant to global change, climate change and data relevant to implementation of the international Conventions on Climate Change, Biodiversity and Sustainability,

(iv) WMO Resolution 40 (Cg-XII) which defines a policy and practice as far as the international exchange of meteorological and related data is concerned and is intended to promote the free and unrestricted exchange of basic data,

(v) the AIOC Statement on data management policy for global ocean programmes@, as submitted by the Committee on IODE (Recommendation IODE-XIV.6, December 1992) and adopted by the Assembly at its Seventeenth Session (Paris, 25 February - 11 March 1993) (paragraph 220 of the Summary Report of the Session),

Noting also GOOS Design Principle D7, which calls for commitments by GOOS participants to establishing, maintaining, validating, making accessible, and distributing high quality, operational data which meet internationally agreed standards,

Considering the need for detailed technical arrangements regarding data and information to be developed in accordance with varying requirements in the different programmes, projects and regions of GOOS,

Instructs the Executive Secretary IOC to establish an *ad hoc* Working Group on Oceanographic Data Exchange Policy, including the two co-chairpersons of JCOMM and the Chairperson of IODE, and other experts to review existing agreements and practices, both within and outside IOC, with regard to the exchange of oceanographic and related environmental data and products, with a view to proposing to the next session of the Assembly;

(a) a restatement of the general IOC principles and policy with regard to oceanographic data exchange; and

(b) a statement of recommended practices and the required institutional arrangements for the operational exchange of oceanographic data;

Invites interested Member States to nominate experts to join the *ad hoc* group and actively contribute to its work.

Financial implications: US$15,000 from Extra-budgetary Sources

Resolution XX-12

THE JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)

The Intergovernmental Oceanographic Commission,

Noting:

(i) Resolution EC-XXXI.13 and section 4.3 of the summary report of IOC/EC-XXXI,

(ii) the Final Report of WMO/ Cg-XIII, general summary, paragraphs 3.4.4.1-3.4.4.6,

(iii) WMO Congress Resolution 14 (Cg-XIII),

Noting further the requirement expressed by the GOOS Steering Committee, the GCOS Steering Committee and the Joint Scientific Committee for the WCRP for a coherent joint IOC-WMO mechanism for the implementation and international co-ordination of operational oceanography,

Recognizing:

(i) the major support already provided to operational oceanographic observing networks and services, the World Climate Programme, GOOS, GCOS and the WMO World Weather Watch (WWW) individually by IGOSS, the DBCP, GLOSS and the WMO Commission for Marine Meteorology (CMM),

(ii) the need to maintain support for maritime safety services as well as responsibilities in the preparation of regulatory and guidance material in this field,

Considering:

(i) the need for a fully co-ordinated mechanism for implementing the requirements for ocean and surface marine meteorological data in support of GOOS and GCOS,

(ii) the expanding requirements of all marine users for a comprehensive range of marine meteorological data and products,

(iii) the need to better co-ordinate and manage the existing range of marine-related activities of IOC and WMO, to reduce duplication and overlap, enhance efficiencies and reduce costs to both bodies,

(iv) the potential benefits to be gained from making better use of the diverse and extensive range of expertise and facilities available to both IOC and WMO at all levels,

(v) the expected cost savings from a rationalization of existing marine-related bodies and activities, and from joint support of marine programme activities by IOC and WMO,

Decides:

(i) to establish a Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), to replace the existing Joint IOC/WMO Committee for the Integrated Global Ocean Services System (IGOSS) and WMO Commission for Marine Meteorology (CMM), with terms of reference as given in the Annex to this Resolution;

(ii) that JCOMM will become the reporting and co-ordinating mechanism for the DBCP and GLOSS and for other appropriate existing and future operational ocean-related activities within IOC;

Urges Member States**:**

(i) to provide every support to JCOMM to contribute to its success, including the nomination of appropriate national representatives to serve on the Technical Commission and to undertake work on its behalf;

(ii) at the national level, to make efforts to enhance co-ordination and co-operation between oceanographers and meteorologists, both to ensure a balanced input to the work of JCOMM, and also to develop a truly multidisciplinary approach to marine monitoring and services, in support of IOC and WMO programmes and of the needs of all maritime users;

Instructs the Executive Secretary IOC, in consultation with the Secretary-General of WMO, the president of CMM and the chairman of IGOSS, to establish procedures and a timetable for the transition to JCOMM, as well as a firm agreement on financing and Secretariat support for the new body.

Financial implications: US$15,000 *per* year from Regular Programme

Annex to Resolution XX-12

Terms of Reference for the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)

The Technical Commission shall be responsible for matters relating to:

Further development of the observing networks

Under the guidance of the relevant scientific and operational programmes of IOC and WMO, development, maintenance, co-ordination and guidance of the operation of the global marine meteorological and oceanographic observing systems and supporting communications facilities of these organizations to meet the needs of the IOC and WMO Programmes and in particular of the Global Ocean Observing System (GOOS), the Global Climate Observing System (GCOS) and the

World Weather Watch (WWW). Evaluation on a continuing basis of the efficiency of the overall observing system and suggesting and co-ordinating changes designed to improve it.

Implementation of data management systems

Development and implementation, in co-operation with the Commission for Basic Systems (CBS), the Committee for International Oceanographic Data and Information Exchange (IODE), the International Council of Scientific Unions (ICSU), and other appropriate data management bodies, end to end data management systems to meet the real-time operational needs of the present operational systems and the global observing systems; co-operation with these bodies in seeking commitments for operation of the necessary national compilation, quality control, and analysis centres to implement data flows necessary for users at time scales appropriate to their needs.

Delivery of products and services

Provision of guidance, assistance and encouragement for the national and international analysis centres, in co-operation with other appropriate bodies, to prepare and deliver the data products and services needed by the international science and operational programmes, Members of WMO, and Member States of IOC. Monitoring of the use of observations and derived products and suggesting changes to improve their quality. Co-ordination of the safety-related marine meteorological and associated oceanographic services as an integral part of the Global Maritime Distress and Safety System of the International Convention for the Safety of Life at Sea (SOLAS).

Provision of capacity building to Member States

Review and analysis of the needs of Member States of IOC and Members of WMO for education and training, and for technology transfer and implementation support in the areas of responsibility of the technical commission. Provision of the necessary technical publications, guidance material, and expert lecturers/trainers and operation of workshops as required to meet the needs. Development of projects to enhance Member States capacity to participate in and benefit from marine meteorological and oceanographic programmes of WMO and IOC.

Assistance in the documentation and management of the data in international systems

Development of co-operative arrangements with the data management bodies of IOC, ICSU, and WMO, such as IODE, the Commission for Climatology (CCl), and the ICSU World Data Centres to provide for comprehensive data sets (comprising both real-time and delayed mode data) with a high level of quality control, long term documentation and archival of the data, as required to meet the needs of secondary users of the data for future long term studies.

These responsibilities exclude those aspects specifically handled by other WMO constituent bodies or equivalent bodies of IOC.

Resolution XX-13

FOURTH SESSION OF THE IOC SUB-COMMISSION FOR THE WESTERN PACIFIC (IOC/WESTPAC)

The Intergovernmental Oceanographic Commission,

Considering the progress of the Sub-Commission in implementing a wide range of projects and programmes since the establishment of the Regional Secretariat in 1994,

Noting with satisfaction that the Sub-Commission is undertaking a strategic planning exercise to further strengthen its role in the region,

Acknowledging with appreciation the support provided by the Governments of Japan, The Netherlands, the People's Republic of China, the Republic of Korea, Sweden, Thailand and the United States of America, in terms of programme implementation and/or staffing support to the Regional Secretariat,

Expressing its appreciation to the Government of the Republic of Korea for hosting the Fourth Session of the Sub-Commission, 22-26 March 1999,

Accepts the Executive Summary of the Fourth Session of the Sub-Commission for the Western Pacific together with the eight Recommendations adopted by the Session;

Decides to take the following actions on the Recommendations:

Recommendation SC-WESTPAC-IV.1 - International Cooperative Study on the Gulf of Thailand

(i) **Approves** the Recommendation;
(ii) **Instructs** the Executive Secretary IOC to find all possible ways to ensure effective implementation and co-ordination of the project and in particular to reach a formal agreement between WESTPAC, SEASTART and SEAPOL covering co-operation in this study;

Recommendation SC-WESTPAC-IV.2 - International Conference for the IODE-WESTPAC 1999, ICIWP'99

(i) **Approves** the Recommendation;
(ii) **Calls** upon Member States to facilitate the participation of their relevant national organizations in the ICIWP'99 Conference;

Recommendation SC-WESTPAC-IV.3 - Regional Graduate School of Oceanography

(i) **Approves** the Recommendation;
(ii) **Instructs** the Executive Secretary IOC to assist in the pursuit of the establishment of a regional graduate school of oceanography and bring relevant opportunities to the attention of WESTPAC Member States;

Recommendation SC-WESTPAC-IV.4 - Global Ocean Observing System

(i) **Approves** the Recommendation;
(ii) **Urges** Member States to support the Global Ocean Observing System and related programmes;

Recommendation SC-WESTPAC-IV.6 - International IOC/WESTPAC Scientific Symposium

(i) **Approves** the Recommendation, including the establishment of a Scientific Organizing Committee charged to organize the Symposium in the Republic of Korea in 2000 or 2001 subject to a final decision being made;
(ii) **Instructs** the Executive Secretary IOC to provide, within available financial resources, support for the Symposium and to take appropriate actions to invite other regional and international organizations, including donor agencies, to support and co-sponsor the Symposium;

Recommendation SC-WESTPAC-IV.7 - Long-Term Strategy

(i) **Approves** the Recommendation;
(ii) **Instructs** the Executive Secretary IOC to assist in seeking ways and means to improve the functioning of the Regional Secretariat for WESTPAC in the implementation of work of the Sub-Commission and IOC global programmes;
(iii) **Urges** Member States of the Sub-Commission to provide the necessary support in line with the recommendations outlined in the revised Long Term Strategy;

Instructs the Executive Secretary IOC to take appropriate actions, in consultation with the Officers of the Sub-Commission to ensure the widest possible participation in the Fifth Session of the WESTPAC Sub-Commission by the Member States;

Urges Member States of the IOC and of the Sub-Commission in particular, to provide further financial support through the IOC Trust Fund dedicated to the Sub-Commission's programme implementation and/or use other modalities of support.

Financial implications: US$600,000 - Action Plan (*per* biennium)
(US$455,000 - Extra-budgetary Sources)
(US$145,000 - Regular Programme)
US$80,000 - Operational cost (*per* biennium)
(Regular Programme)

Resolution XX-14

THE IOCARIBE SUB-COMMISSION

The Intergovernmental Oceanographic Commission,

Noting :

(i) the positive evolution of the IOCARIBE activities during the last Sub-Commission intersessional period 1995-1999 and in particular the progress made in implementing the IOCARIBE Medium Term Strategy 1996-2000,

(ii) that the Sub-Commission has adopted a new Medium Term Strategy 1999-2003, which assess and reformulates the strategic guidelines for the Sub-Commission in the near future, built on the concept of it being a living document,

(iii) with satisfaction that a significant number of Regional Projects and related services - including the new regional component of GOOS and other important projects as listed in the related Recommendation - are being or will be implemented in the region using the decentralized scheme for project management and implementation,

Having considered the Executive Summary report of the Sixth Intergovernmental Session of IOCARIBE, and the twelve recommendations adopted during that Session,

Being aware that:

(i) the elaboration of a unified regional Scientific Plan for the decade 2001-2010 has been recommended by the Member States of the Sub-Commission, in order to improve co-ordination and harmonize activities with other organizations carrying out projects and activities in the region,

(ii) the unified regional scientific plan will be presented to the Seventh Session of IOCARIBE,

Endorses the Executive Summary report of IOCARIBE-VI Session and the new IOCARIBE Medium Term Strategy 1999-2003;

Decides to :

(i) approve the recommendations adopted in IOCARIBE-VI;

(ii) approve the Action Plan and Budget for the period 1999-2001, as presented in the Annex to this resolution;

Urges :

(i) Member States to assist and contribute financially and in-kind to the implementation of the Strategic Programmes and Regional Projects;

(ii) funding agencies, donor countries and other organizations and national institutions to actively communicate and co-operate in the implementation of the IOCARIBE Action Plan and Regional Projects.

Financial implications: as in the annex to this Resolution.

Annex to Resolution XX-14

The IOCARIBE Sub-Commission - Financial Implications
(in US$)

	Sources for the biennium	2000	2001
Programme implementation			
Unified Regional Scientific Agenda		15,000	5,000
Strengthening National Marine Policies and internal coordination networks		10,000	10,000
Information Management and Networking		20,000	20,000
Strategic Science Plan and Related Services		5,000	
IOCARIBE Symposium 2000		40,000	
Evaluation and assessment of Regional Projects (science and services)		15,000	15,000
Sub-Total	**100,000 (TF*)** **55,000 (EX*)**	**105,000**	**50,000**
Regional Secretariat			
Office running expenses	60,000 (RP*)	30,000	30,000
TOTAL	**215,000**	**135,000**	**80,000**

* TF: Trust Fund EX: Extra-budgetary Sources RP: Regular Programme

Resolution XX-15

ESTABLISHMENT OF A REGIONAL IOCINCWIO OFFICE

The Intergovernmental Oceanographic Commission,

Recalling:

(i) the support by the Nineteenth Session of the IOC Assembly of the proposal to set up a regional office for IOCINCWIO within the region,

(ii) the acceptance by the Nineteenth Session of the IOC Assembly of the offer of Kenya to host the regional office for IOCINCWIO,

Noting:

(i) the long and active history of the IOCINCWIO Regional Committee which was established through Resolution XI-9 of the Eleventh Session of the IOC Assembly in 1979,

(ii) the progress of programmes and projects developed and implemented in the region within the framework of major IOC activities, including sea-level observation and data analysis (GLOSS); International Bathymetric Chart of the Western Indian Ocean (IBCWIO); survey of potentially harmful marine microalgae (HAB); regional guidelines for assessment, interpretation and management of coastal changes (OSNLR); marine pollution and nutrient monitoring; Regional Co-operation in Scientific Information Exchange in the Western Indian Ocean region (IODE/RECOSCIX-WIO); Ocean Data and Information Network for Eastern Africa (IODE/ODINEA),

Recognizing with appreciation:

(i) the financial and in-kind contribution provided by various donors,

(ii) the support and guidance of the IOC Executive Secretary in encouraging the development of the IOCINCWIO programme and for identifying the necessary resources,

(iii) the offer of the Kenya Government to host the IOCINCWIO regional office at the Kenya Marine and Fisheries Research Institute (KMFRI), Mombasa, Kenya including the provision of local support staff, office space and furniture, utilities and computer equipment,

Noting the view expressed by Member States that the effectiveness and implementation efficiency of on-going and proposed IOCINCWIO projects will be considerably improved through the establishment of a regional IOCINCWIO office,

Reaffirms the need to establish an IOCINCWIO regional office, to be hosted, for an initial period of two years, by the Kenya Marine and Fisheries Research Institute (KMFRI) in Mombasa, Kenya, which will operate in accordance with the terms of reference annexed to this resolution;

Instructs the Executive Secretary IOC to:

(i) hire a consultant (P-3 level) or establish a National Professional Officer (NPO) post in Kenya for the purpose of the IOCINCWIO regional office for an initial period of two years;

(ii) provide financial support within available budgetary resources, for the operational costs of the IOCINCWIO regional office for an initial period of two years;

Urges Member States to assist UNESCO and IOC with the establishment and maintenance of the IOCINCWIO Regional Office through the provision of financial or in-kind support.

Financial implications: US$115,000 for 2000-2001 (US$15,000 from Regular Programme)
(US$100,000 from Extra-budgetary Sources)

	IOC contribution	**Kenya contribution**
Operational costs (*per* year in US$)		
- Professional Staff	40,000	-
- Support staff	-	9,000
- Regional travel	10,000	-
- Communication & Operations	5,000	2,000
	55,000 *p.a.*	**11,000 *p.a.***
Establishment costs non recurrent (in US$)		
- Office furniture	-	5,000
- Computer equipment	-	5,000
- Equipment	5,000	-
	5,000	**10,000**
Total for biennium 2000-2001:	**115,000**	**32,000**

Annex to Resolution XX-15

Terms of Reference
of the IOCINCWIO Regional Office

Purpose:

To facilitate and co-ordinate the implementation of the IOC programme activities in the IOCINCWIO region.

Activities and Responsibilities:

(a) to assist in the co-ordination of implementation of the IOCINCWIO workplans;
(b) to monitor and report to the IOCINCWIO Chairs and IOC Executive Secretary on the progress of implementation of the IOCINCWIO workplans;
(c) to advise on, and assist IOCINCWIO Member States with the formulation of project proposals;
(d) to assist in the planning, organization and implementation of meetings, workshops and training courses;
(e) to liaise with the IOC science and service programmes;
(f) to assist in the dissemination of information to IOCINCWIO Member States;
(g) to promote the IOC in general, and its programme activities related to IOCINCWIO in particular at appropriate *fora*;
(h) to establish and maintain relations with relevant organizations, agencies, institutions and individuals with the view to ensure complementarity and to stimulate south-south co-operation.

Level of Staffing:

It is anticipated that initially the IOCINCWIO Regional Office will be composed of one full-time professional and not less than four support staff.

Resolution XX-16

IMPLEMENTATION OF IOCINDIO WORKPLAN AND ESTABLISHMENT OF A REGIONAL SUPPORT OFFICE

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIX-11 of the IOC Assembly on the IOC Regional Committee for the Central Indian Ocean,

Noting the progress in the implementation of programmes and projects developed for the region since the Nineteenth Session of the IOC Assembly,

Recognizing the support and guidance of the Executive Secretary IOC in encouraging the development of the IOCINDIO programme and for identifying the necessary resources,

Considering the view expressed by Member States that the effectiveness and implementation of the IOCINDIO workplan would be greatly improved through the establishment of an IOCINDIO regional support office,

Decides that implementation of the programmes identified by the IOCINDIO-II Session should continue;

Instructs the Executive Secretary IOC to:

(i) convene the Third Session of the IOCINDIO Regional Committee in the Islamic Republic of Iran in December 1999;

(ii) hold the Regional Workshop on Integrated Coastal Zone Studies including marine pollution in conjunction with the IOCINDIO-III;

(iii) hold a regional workshop on Sea Level Observation and Data Analysis;

(iv) organize a regional workshop on Coral Reef Monitoring and Management;

(v) organize the regional workshop on storm surges and regional meeting for finalizing the plan of action to implement the project proposal on storm surges in the northern part of the Indian Ocean;

Further instructs the Executive Secretary IOC to consult the Member States of the region to facilitate the establishment of an IOCINDIO Regional Support Office, with the Terms of Reference

annexed to this resolution, after the endorsement of the proposal by the Third Session of IOCINDIO.

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Financial implications: US$100,000 for 2000-2001 (US$35,000 from Regular Programme)
(US$65,000 from Extra-budgetary Sources)

Annex to Resolution XX-16

Terms of Reference of the IOCINDIO Regional Support Office

(i) to assist the Chairman IOCINDIO in the co-ordination and implementation of the IOCINDIO Workplan as approved by the Regional Committee;

(ii) to monitor and report to the IOCINDIO Chairs and Executive Secretary IOC on the progress of implementation of the IOCINDIO workplan;

(iii) to advise and assist IOCINDIO Member States with the formulation of project proposals;

(iv) to assist in the planning, organization and implementation of meetings, workshops and training courses in consultation with the Chairman IOCINDIO;

(v) to assist in the dissemination of information to IOCINDIO Member States;

(vi) to establish and maintain relations with relevant organizations, agencies, institutions with the view to promoting co-operative activities as approved by IOCINDIO in co-ordination with the Chairman of IOCINDIO.

Resolution XX-17

IOC REGIONAL COMMITTEE FOR THE CENTRAL EASTERN ATLANTIC (IOCEA)

The Intergovernmental Oceanographic Commission,

Considering that the IOCEA region covers a very important area including more than 20 countries and Islands States,

Recalling that the Africa is a priority not only in UNESCO but within the framework of the United Nations Special Initiatives for Africa (UNSIA),

Noting with regret that no action was taken to ensure the establishment of the regional Secretariat in the region and to appoint a permanent staff member according to the recommendations from the Fourth Session of IOCEA, Las Palmas, May, 1995,

Considering the need for co-ordination and follow-up of the actions, recommendations and resolutions concerning the IOCEA Region to ensure their effective execution,

Decides to establish an IOCEA regional support office to co-ordinate IOC activities;

Urges the Executive Secretary IOC to:

(i) assist in establishing a regional office in consultation with the Members States of the Region;

(ii) ensure the full implementation of RECOSCIX-CEA;

(iii) strengthen IOC capacity building programmes in the Region.

Financial implications: US$300,000 (US$30,000 from Regular Programme)
(US$270,000 from Extra-budgetary Sources)

Resolution XX-18

THE BLACK SEA REGIONAL COMMITTEE (BSRC)

The Intergovernmental Oceanographic Commission,

Recalling:

(i) Resolution XVIII-17 of the IOC Assembly,

(ii) Resolution EC-XXIX.7 of the IOC Executive Council,

Noting with satisfaction:

(i) the essential progress in implementation of the two pilot projects "Black Sea GOOS" and "Black Sea Fluxes" within the framework of the Black Sea Regional programme,

(ii) the effective co-ordination established by the IOC Black Sea Regional Committee with other on-going Black Sea projects,

Emphasizing the deterioration of the ecological situation in the Black Sea region caused by: a deficit of the water ventilation as a consequence of two extremely warm winters; the degradation of the ecosystem; an increasing antropogenic impact on marine environment; the extraction of oil and gas and its transportation; and the contamination of the coastal waters and urbanization of the nearshore zone,

Accepts the Intersessional Report of the IOC Black Sea Regional Committee and its recommendations;

Approves the terms of references of the IOC BSRC proposed by the Second Session of the Regional Committee as annexed to the Resolution;

Instructs the Executive Secretary IOC to invite:

(i) the Member States of the region to mobilize their national resources for the implementation of the approved pilot projects "Black Sea GOOS" and "Black Sea fluxes" and to establish a robust management strategies for the living resources of the Black Sea;

(ii) EU, UNEP, IAEA, WMO and other organizations interested in the region to support the BSRC activities;

Further instructs the Executive Secretary IOC to seek ways to strengthen the financial and technical support of the BSRC.

Financial implications: US$140,000 (US$100,000 from Regular Programme)
(US$40,000 from Extra-budgetary Sources)

Annex to Resolution XX-18

Terms of Reference of the IOC Black Sea Regional Committee (BSRC)

BSRC is an intergovernmental subsidiary body, composed of National Co-ordinators designated by the Member States of the IOC, responsible for the co-ordination and supervision of the scientific and service activities of the Commission at the regional level.

BSRC is expected to take decisions and act as necessary to give effect to the Commission's policy decisions, within its terms of reference and allocated budget. BSRC makes Recommendations to the Governing Bodies of the Commission on policy matters within its terms of reference and on future actions required.

1. The IOC Black Sea Regional Committee shall promote, develop and co-ordinate the regional collaborative co-operative joint marine sciences and services programmes, identify the requirements for resources, prepare the overview budgets and report to governments and the IOC Assembly; the BSRC should co-ordinate its activities closely with IOC programmes.

2. The IOC Black Sea Regional Committee shall plan and co-ordinate the marine sciences and services activities of the IOC Regional programmes, taking into account the relevant provisions of the Convention for Protection of the Black Sea against the Pollution, the Black Sea Fisheries Convention, and International Programmes carried out by international institution and organizations (UNESCO, UNEP, WMO, WHO, IMO, IAEA, FAO, UNDP, the World Bank, the European Union, etc.), so as to avoid overlap and duplication of efforts and ensure co-ordination with other relevant activities.

3. The IOC Black Sea Regional Committee shall establish close connection with all existing relevant regional programmes, so as to avoid duplications and also promote integration between science and management aspects.

4. The IOC Black Sea Regional Committee shall report on programme implementation, proposals and budget requirements to the IOC Assembly.

Resolution XX-19

IOC ACTIVITIES RELATED TO THE CASPIAN SEA

The Intergovernmental Oceanographic Commission,

Recalling:

(i) Resolution XIX-14 of the IOC Assembly by which the Executive Secretary IOC was instructed to consider ways and means to strengthen IOC's support of cooperative efforts of the riparian countries of the Caspian Sea region and more active involvement of IOC in dealing with Caspian Sea environmental problems,

(ii) Resolutions of the 28th General Conference of UNESCO calling for regional co-operation in the Caspian Sea Basin,

Recognizing the concern expressed by the countries of the region with regard to the deterioration of the state of the Caspian Sea environment caused by natural and anthropogenic factors and the willingness of the countries to co-operate in solving environmental problems,

Considering that due to the multidisciplinary nature of the Caspian Sea environmental problems a co-ordinating mechanism should be established within UNESCO to ensure involvement of various programmes of UNESCO, particularly IOC, IHP and MAB, to address the Caspian Sea environmental problems in a coherent, co-ordinated and effective way,

Noting also the work of the WMO Committee on co-ordination of the activities of the Caspian Sea countries related to hydrometeorology and marine pollution monitoring within the scope of the CASPAS programme as well as activities of UNEP, IAEA, UNDP/GEF and other international organizations in the region,

Noting further the importance of the Sub-marine Groundwater Discharge (SGD) Project for the successful implementation of efforts in the Caspian Sea Environment Protection,

Emphasizing the urgent need to assist the riparian countries in their capacity building, particularly in training their young specialists in the field of marine ecology and marine observations in order to be actively involved in studying the Caspian Sea environmental problems,

Invites Member States, international organizations and funding agencies concerned to use the experience of the IOC in developing ocean observing systems and national and regional research and monitoring programmes in the Caspian Sea area under GOOS, GCOS and GLOSS;

Instructs the Executive Secretary IOC to take necessary actions for the organization of a Regional Conference with the objective to develop a Plan of Action for the protection of the Caspian Sea environment and identify a mechanism for co-ordination of the on-going and planned activities in the Caspian Sea region.

Financial implications: US$15,000 from Regular Programme

Resolution XX-20

PAN-AFRICAN CONFERENCE ON SUSTAINABLE INTEGRATED COASTAL MANAGEMENT (PACSICOM)

The Intergovernmental Oceanographic Commission,

Recalling:

(i) Resolution EC-XXXI.6 of the IOC Executive Council instructing the Executive Secretary IOC to strengthen the IOC's intersectoral co-ordinating role to ensure the follow-up of PACSICOM with particular emphasis on GOOS-Africa,

(ii) Resolution EC-XXXI.7 of the IOC Executive Council on Priority Africa specifically calling for the necessity to use the unique opportunity offered by the PACSICOM Process to reinforce the existing and to develop new modern infrastructures for marine and coastal research activities in Africa,

Noting with appreciation:

(i) the assurance given by the Director-General of UNESCO to follow up the PACSICOM technical workshops in the framework of the Priority Africa Actions,

(ii) the strong statement made by many delegates at the I-GOOS-IV meeting, Paris, 23-25 June 1999 inviting the IOC Secretariat and Member States, and the I-GOOS Committee to support the implementation of the GOOS-Africa as an important regional component of GOOS,

Recognizing:

(i) that the PACSICOM Process represents an appropriate window of opportunity for intergovernmental dialogue, as well as regional and international co-operation *vis-à-vis* Africa's marine environment,

(ii) the high priority that African States, the Organization of African Unity (OAU), as well as the Director-General of UNESCO give to the PACSICOM Process,

(iii) the leading role of the IOC as a co-ordinating unit of UNESCO for PACSICOM and GOOS-Africa,

(iv) the PACSICOM initiative as an original and epistemological framework for coupling science with sustainable integrated coastal area and ocean management in Africa,

Instructs the Executive Secretary IOC to:

(i) collaborate with African States to design relevant project proposals to be presented to donors for funding during the Partnership Conference addressing the African process for the development and protection of the marine and coastal environment in Africa scheduled for 2001;

(ii) collaborate with African experts in drafting and implementing pilot projects with particular emphasis on the GOOS-Africa programme, Capacity Building and the development of the UNESCO Chairs in Africa;

(iii) strengthen IOC's intersectoral co-ordinating role for the PACSICOM Process and approach the other UNESCO Sectors, as well as other United Nations agencies and donors to support the implementation of the recommendations of the PACSICOM;

(iv) undertake, in consultation with African Members States and the GOOS-Africa Co-ordinating Committee, the necessary action as recommended by the PACSICOM resolutions, to convene a workshop for drafting a project proposal for the implementation of GOOS in Africa under the leadership of that Co-ordinating Committee and the Scientific and Technical Research Commission (STRC) of the Organization of the African Unity;

(v) ensure that the legal aspects of data exchange and coastal management are clearly reflected in that forthcoming draft proposal, and that the management structure for the project will be African-driven;

(vi) submit the forthcoming proposal together with the GOOS-Africa Co-ordinating Committee and the Executive Secretary of the STRC to the donors through the Preparatory Committee for the Partnership Conference for the African Process for the Development and Protection of the Marine and Coastal Environment in Africa and work in close collaboration with the STRC to implement the project;

Urges Member States and donors to increase their involvement with PACSICOM through active participation in the IOC sponsored activities, by initiating new co-operative projects with the IOC in the PACSICOM initiative, in particular at regional and national levels, and by providing funding for these purposes.

Financial implications : US$400,000 (US$20,000 from Regular Programme)
(US$20,000 from Trust Fund)
(US$360,000 from Extra-budgetary Sources)

Resolution XX-21

PRIORITY AFRICA

The Intergovernmental Oceanographic Commission,

Recalling:

(i) the IOC Executive Council Resolution EC-XXXI.7,

(ii) the United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Conference on the Environment Development (UNCED), the World Summit for Social Development and the Seventh Session of the United Nations Commission on Sustainable Development,

Acknowledging that Africa has been declared a priority within UNESCO with programmes such as Priority Africa,

Noting that African populations cannot take advantage commensurate with the abundance of resources in African oceans and coastal waters, due to gaps in scientific knowledge, infrastructure, and technological capacity,

Being aware that initiatives directed towards better management of oceans and coastal resources in Africa can serve as leading examples to similar experiences in developing countries of other regions,

Instructs the Executive Secretary IOC to assist in the pursuit of the following measures:

(i) the reinforcement of the privileged partnership with the Scientific Technical and Research Commission (STRC) of the Organization of African Unity (OAU), for ocean matters related to Africa;

(ii) the facilitation of the transfer of data related to African marine waters now scattered and stored all over the world, to African marine research institutions and universities;

(iii) sensitization of donors to consider support for:

  (a) the acquisition by African marine research institutions of modern technologies for data processing, analysis, interpretation and exchange;

  (b) the availability of well-equipped research vessels and ships of opportunity for routine measurements of oceanographic and meteorological parameters in African waters and island States;

  (c) the reinforcement and expansion of the network of tide gauges, and study of sea level of the African coasts and Island States;

  (d) the training of African specialists to manage remote sensing and other oceanographic data and an increase in the number of land receiving stations;

(e) the expediting of the implementation of the recommendations of IOCEA-IV (Las Palmas, May 1995) ; and IOCINCWIO-IV (Mombasa, Kenya, May 1997), stressing that separate and sufficient funding be allocated to facilitate these matters.

Financial implications: US$200,000(US$20,000 from Trust Fund)
(US$180,000 from Extra-budgetary Sources)

Resolution XX-22

OCEAN DATA AND INFORMATION NETWORK FOR AFRICA - SECOND PHASE (ODINAFRICA-II)

The Intergovernmental Oceanographic Commission,

Recalling:

(i) the recommendation of the IOCINCWIO Member States, during the Second Session of IOCINCWIO, to establish a regional network for marine information exchange,

(ii) the request by the IOCEA Member States, during the Second Session of IOCEA, to investigate the possibility to develop a RECOSCIX network for the IOCEA region,

(iii) the endorsement by IOCEA-III, of a project proposal for the development of a RECOSCIX network for the IOCEA region,

(iv) the recommendation of the IOCINCWIO Member States, during the Fourth Session of IOCINCWIO, to develop the ODINEA project (Ocean Data and Information Network for Eastern Africa),

(v) the endorsement of the ODINEA project proposal by IODE-XV,

(vi) the successful implementation of the RECOSCIX-WIO, ODINEA and RECOSCIX-CEA (ODINEA and RECOSCIX-CEA within the framework of the ODINAFRICA project),

(vii) the requests made by African Member States on many occasions, for the IOC to assist with the development of national and regional data and information management facilities,

(viii) the recommendations made by PACSICOM identifying the need to *inter alia*:
- the formation of an Africa-wide network of National Ocean Data Centres,
- facilitating the provision of modern communication systems such as Internet connections and data transfer mechanisms,

Acknowledging:

(i) the efforts by the IOC Secretariat in securing support for the implementation of the RECOSCIX-WIO, RECOSCIX-CEA and ODINEA projects (ODINEA and RECOSCIX-CEA within the framework of the ODINAFRICA project),

(ii) the support provided by Belgium, Sweden and Flanders for the development of the RECOSCIX-WIO, RECOSCIX-CEA and ODINAFRICA projects (ODINEA and RECOSCIX-CEA within the framework of the ODINAFRICA project),

Noting the draft proposal 'OCEAN DATA AND INFORMATION NETWORK FOR AFRICA - Second Phase (ODINAFRICA-II)', prepared with the collaboration of African experts, in consultation with, and guidance of the IOC Secretariat,

Noting with appreciation the objectives of the ODINAFRICA-II Project Proposal:

(i) providing assistance in the development and operation of National Oceanographic Data (and Information) Centres and establishing their networking in Africa,

(ii) providing training opportunities in marine data and information management, applying standard formats and methodologies as defined by the IODE,

(iii) providing support for access to the Internet for communication, exchange and dissemination of data and information,

(iv) Assisting in the development and maintenance of national, regional and Pan-African marine meta-data, information and data holding databases,

(v) Assisting in the development and dissemination of marine data and information products responding to the needs of a wide variety of user groups at the national and regional levels and responding to national and regional priorities,

Acknowledging that ODINAFRICA will provide national and regional structures, mechanisms, services and products contributing towards the sustainable management of ocean resources and coastal zones,

Urges African Member States to:

(i) review and finalize the ODINAFRICA-II proposal for submission to interested donors;

(ii) identify substantial counterpart contributions and secure government commitment in order to ensure the long-term sustainability of national and regional data and information management facilities, developed within the framework of the project;

(iii) ensure that the data and information management infrastructures, services and products serve well defined national and regional science and management priorities;

Urges IOC Member States, donors and other International Organizations to provide support for the successful implementation of the ODINAFRICA-II project, possibly through complementary

activities to strengthen the services and products, with special emphasis on serving the needs of ICAM;

Instructs the Executive Secretary IOC to:

(i) provide guidance to African Member States in the finalization of the ODINAFRICA-II project proposal;

(ii) submit, as soon as possible, the ODINAFRICA-II project proposal to (an) interested donor(s) on behalf of the African Member States.

Financial implications for 2000-2001: US$140,000 from Regular Programme and non ear-marked Trust Fund
US$1,360,000 from Trust Fund (to be obtained)

Resolution XX-23

REGIONAL SECRETARIAT OFFICES OF THE SUB-COMMISSIONS FOR IOCARIBE AND WESTPAC

The Intergovernmental Oceanographic Commission,

Recalling Resolution XVIII-16 of the IOC Assembly, which notes with concern the interim situation of staffing in the regional secretariat of IOCARIBE and Resolution XIX-9 of the IOC Assembly at its Nineteenth Session (1997), concerning the creation of a permanent post of Assistant Secretary for IOCARIBE,

Recalling also Resolution XV-9 of the IOC Assembly at its Fifteenth Session (1989), concerning the establishment of the Sub-Commission for the Western Pacific, with a regional secretariat subsequently established in 1994 in Bangkok through Resolution XVII-12, and a permanent UNESCO post established since 1997,

Expressing its appreciation to the Governments of Colombia and Thailand for hosting the regional secretariats including the provision of secretarial support,

Noting with satisfaction the progress made in both Sub-Commissions in the implementation of regional activities through their respective secretariats,

Acknowledging the current trend and support within UNESCO and the IOC, in response to the request from Member States to enhance the implementation of regional activities through a process of decentralization,

Noting with concern that the post for the regional secretariat of IOCARIBE since its transfer from Cartagena to Paris in 1994, consequently has been filled by a consultant functioning as "Acting Secretary",

Also noting with concern the intention of the UNESCO Science Sector to abolish the permanent post of Assistant Secretary for WESTPAC, with serious consequences for the staffing situation of both regional secretariats,

Invites the Director-General of UNESCO to take necessary steps to maintain a permanent post for the WESTPAC Sub-Commission, and the re-establishment of a permanent post for the IOCARIBE Sub-Commission, as they are perceived to be instrumental in the implementation of activities;

Instructs the Executive Secretary IOC to continue searching for means to provide permanently the core staff necessary in both regional secretariats in order to ensure the success of programmes and to maintain continuity in the implementation of regional activities;

Urges Member States to consider the different options available to support regional secretariats including the secondment of staff.

Financial implications: the financial implications are presented under Resolution XX-25 on IOC Programme and Budget for 2000-2001

Resolution XX-24

FOLLOW-UP ACTIONS TO THE 1998 INTERNATIONAL YEAR OF THE OCEAN

The Intergovernmental Oceanographic Commission,

Recognizing that the 1998 International Year of the Ocean (IYO) provided a unique opportunity to respond to national, regional and international needs in promoting ocean research and increasing awareness of the importance of the ocean and its protection,

Appreciating the efforts made by the IOC Member States in meeting the IYO objectives and the support provided by the IOC Secretariat in co-ordinating the IYO activities,

Acknowledging the need for keeping momentum gained during the IYO in increasing awareness and extending it in the coming years,

Agrees in principle on the follow-up Actions contained in the Annex attached to this Resolution;

Urges Member States to consider the provision of additional resources for the realization of these actions;

Instructs the Executive Secretary IOC to focus on sustaining the relationships that have been established and take measures for attracting governmental and public support needed.

Financial implications: US$450,000 (US$40,000 Regular Programme)
(US$410,000 Extra-budgetary Sources)

Annex to Resolution XX-24

Existing and Potential Actions

The draft plan of action was developed in response to this Resolution, taking into account the recommendations contained in Document EC-XXXI/13 and the views expressed by the participants of the Thirty-first Session of the Executive Council.

The plan offers a list of actions, which are based on and adhere to the main objectives of the IYO, particularly in the fields of education and awareness. It is designed in recognition that the coming years should be used to attract governmental and public support as well as commitments for ocean research and protection issues, to ensure that more people realize the importance of the ocean to the ecological balance of the earth and its potentiality to social and economic development. It takes into account that, due to the IYO efforts, education to raise public awareness of the importance and relevance of maintaining the health and productivity of oceans emerged as a key priority. A schedule of existing and proposed activities is given below:

$ Continuation of the collection of signatures under My Ocean Charter - continuously.

$ Address the United Nations with the request to define a universal UN Ocean Day and call on Member States to devote this Day to increasing awareness and protecting the ocean environment.

$ Organization of the Third Oceanographic Conference under the title "Ocean and Society - 10 years after Lisbon" - Year 2004.

$ Encouragement of co-operation with industries and, as appropriate with the military in increasing the state of knowledge on the quality of the world's oceans by implementation of a worldwide conference on the military and industry's role in ensuring the environmental quality of the oceans - Year 2000.

$ Facilitation of the "Clean-up Beaches" co-ordination effort - Continuously.

$ Promotion of research/education cruises with youth participation based on the experiences gained within the framework of the Floating University programme and children's cruises held during the IYO - Years 1999-2000.

$ Continuation of efforts in establishing close working relationships with mass media for promoting the IOC's leading role in developing global ocean awareness by arranging briefings, press conferences, etc. - Continuously.

$ Production of a CD-ROM containing the activities of Member States in the IYO - Year 1999.

$ Development and publication of a report on national, UNESCO and IOC initiatives in the area of basic education on marine environment and the ocean to be used as a guidance in developing academic programmes in schools - Year 1999.

$ Publication of educational kits for three school children age groups and organization of a test in using these materials in a number of selected schools (jointly with the Education Sector of UNESCO) - Years 1999-2000.

$ Re-design and maintenance of the IYO Web site with the focus on the results of the IYO and follow-up actions - Year 1999.

$ Creation of a biennial UNESCO/IOC Ocean Award and of a commemorative medal in the memory of one of the world known distinguished oceanographers for outstanding achievements in ocean research and protection, creation of the IOC prizes for contribution to the ocean awareness and promotion - Year 1999.

Resolution XX-25

IOC PROGRAMME AND BUDGET FOR 2000-2001

The Intergovernmental Oceanographic Commission,

Having considered the preliminary proposals regarding the structure, formulation and budgetary framework for the 2000-2001 biennium (Draft UNESCO 30 C/5), within which emphasis is given to a results-oriented approach,

Having also considered the Draft Programme and Budget 2000-2001 as contained in Document IOC-XX/2 Annex 10,

Recalling the unique role of the IOC as the competent intergovernmental body dealing with marine science and as the ocean arm of UNESCO, operating through the concerted action of IOC Member States,

Noting that the regular funds provided by UNESCO have attracted substantial supplementary support from Member States, notably through contributions to the IOC Trust Fund,

Noting also the importance of continuing commitments by Member States in addressing the long-term plans of the IOC,

Emphasizing that collective participation in ocean science and ocean services programmes , and the associated observing systems, can more effectively contribute to the protection and sustainable development of the ocean and coastal areas and thereby support economic development and alleviate poverty,

Decides that the IOC Programme and Budget for 2000-2001 should be based upon two main lines of action as spelled out in Section II.2.4, paras 02241-02242 of the Draft UNESCO Programme and Budget 2000-2001 (Draft 30 C/5):

(i) reducing scientific uncertainties about coastal and oceanic processes;

(ii) meeting the needs of ocean-related conventions and programmes;

Invites the General Conference of UNESCO to take into account the results outlined in the Draft 30 C/5 and especially the urgency of the planned outcomes elaborated in the following:

(i) to improve forecasting of extreme events, such as those generated by El Niño events, tsunamis and storm surges, for example through a substantial increase in surface and subsurface ocean observations;

(ii) to assist developing countries to mitigate the effects of drought and flood through improved forecasts of rainfall in western Africa and eastern Brazil based on increased ocean observations particularly in equatorial region;

(iii) to meet the newly stated requirements of the Conference of the Parties to the Framework Convention on Climate Change by assisting in the design of national plans for climate observation;

(iv) to meet in particular, the needs of coastal and fisheries managers by designing the coastal component of the Global Ocean Observing System (GOOS), including elements of the Coastal, Health of the Ocean (HOTO) and Living Marine Resources Modules;

(v) to provide developing countries with improved access to data and information for management purposes through co-operative assistance programmes, such as the ODINAFRICA project;

(vi) to mitigate the impact on human health from occurrences of harmful algal blooms through the provision of guidelines on monitoring, leading to better predictive capability;

(vii) to contribute in the protection of the marine environment and human health through provision and testing of low-cost methodologies for rapid assessment of marine pollution;

(viii) to assist Member States whose economies depend on the sustainable use of coral reefs through appropriate training and awareness-raising programmes, focussed in the Indian Ocean and on Small Island Developing States;

(ix) to work with Secretariats of Global Conventions to develop protocols for proposals, to assist developing countries to access the GEF and other sources of funds to build capacity for improving national planning through (a) more effective collection of climate data and use of climate forecasts, and (b) more effective collection and use of marine biodiversity data for conservation purposes;

(x) to access other funds including extra-budgetary funds to build the capacity of developing countries in Africa for the more effective collection and use of coastal ocean data for use in integrated coastal area management, through participation and assistance to regional Member States in the Partnership Conference within the African Process;

(xi) to strengthen the ability of the IOC to address the regional implementation of its programmes, through the provision of support, and in particular in meeting the staffing requirements in the WESTPAC and IOCARIBE Sub-Commissions;

(xii) to assist in the economic development of marine related industries, such as tourism, particularly in developing coastal states, through the better management of coastlines and marine activities;

Requests that the Director-General include within the Draft 30 C/5 proposals for the maintenance of the level of funding received by IOC in the 29 C/5 Programme and Budget and adjusting the budget contained in the draft 30 C/5 accordingly;

Requests further the Director-General to consider an increase in financial support provided to the IOC to enable it to respond more effectively to the above needs of Member States, particularly of developing countries in their efforts to mobilize international funding;

Requests the transfer of an additional US$493,000 in staff allocation from UNESCO to the IOC to fulfill the needs of regional Member States to maintain support of the IOCARIBE and WESTPAC Secretariats;

Urges UNESCO Member States, through their national representatives, to actively support the IOC programme proposals when the Draft 30 C/5 is being considered by the UNESCO Executive Board and the General Conference;

Urges Member States to continue and increase their support to the IOC through direct and in-kind contributions;

Submits to the 30th UNESCO General Conference the Programme Resolution contained in the Annex;

Authorizes the Executive Council IOC to approve at its Thirty-third Session any adjustments to the programme and Budget that might be required in the light of resources and expenditures.

Annex to Resolution XX-25

Proposed Resolution

THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

The Member States of the Intergovernmental Oceanographic Commission respectfully request the Executive Board of UNESCO to consider this draft Resolution for transmission to the General Conference for approval.

The General Conference,

Having taken note of the report on the activities of the Intergovernmental Oceanographic Commission (IOC) during the biennium 1998-1999 and matters brought to its attention by the Twentieth Session of the IOC Assembly:

1. Requests the IOC, in accordance with its statutes, to pursue the programme of work for 2000-2001, as approved at its twentieth session, and in particular:

(a) Main Line of Action 1. Reducing scientific uncertainties about coastal and oceanic processes;

(b) Main Line of Action 2. Meeting the needs of ocean-related Conventions and programmes;

2. Authorizes the Director-General to support the IOC by a financial provision in the amount of US$7,224,200 under the Regular Programme, Major Programme II, of which US$3,064,900 will be attributed to programme implementation and US$4,159,300 to staff costs;

3. Expresses its appreciation to the Member States and organizations that have supported the IOC programmes through voluntary and in-kind contributions, including staff, and invites them to continue their support for the 2000-2001 biennium.

ANNEX III

ADDRESSES

A. Opening address by Dr Geoffrey Holland Chairman of IOC

on 29 June 1999

Mr Executive Secretary,
Distinguished Delegates and Observers,
Ladies and Gentlemen,

It gives me great pleasure to welcome you to this twentieth session of the IOC Assembly.

This Assembly marks the end of my four-year term of office as Chairman. When I accepted the challenging responsibilities conferred on me as Chairman, I did so with a personal priority of raising the visibility of the Commission and of increasing the involvement of Member States. Progress has been made, although I cannot report that I am completely satisfied.

I was fortunate to be Chairman during the International Year of the Ocean and the IOC certainly benefitted from that event in terms of increased awareness of the ocean and for ocean issues. I am proud of the collective effort made by the IOC staff to make the year the success it was. Declarations were made, at several important international and intergovernmental meetings, on the need to protect the oceans and sustain its resources. The Independent World Commission on the Oceans gave the same message in its report and eighty-five individual countries signed the Ocean Charter, with its message of marine protection and management. The International Year of the Ocean was not meant to be a single event, it was a stepping stone to the future. Have we achieved the goals we set ourselves for the ocean? The answer is we have made a begginning. A few countries have adopted legislation and management frameworks for their ocean areas, but not enough. Many educational ocean initiatives will persist in schools and communities, but not enough. Some governments may increase the spending on ocean activities but not enough. Intergovernmentally there has been attention paid to ocean affairs, but not enough.

Earlier this year the UNCSD met to review the progress on the "Oceans and Seas" requirements of Agenda 21 and again much was said about concerns for the ocean environment and the need for governmental action. Hopefully the decisions taken in New York concerning improved ocean governance will come to pass, although intergovernmental action takes time and patience must be exercised. We cannot relax in our efforts to bring more governmental attention to ocean issues. Let us be very clear one point. It is not the future of the Intergovernmental Oceanographic Commission that should be our major concern. It is the future of one of the major life support systems of our planet that is in jeopardy. While governments are debating whether they can give a few extra days of attention to the oceans, coastal habitats are disappearing at an alarming rate. While governments are deciding whether they can find a few more resources for ocean climate, ocean-related changes are spawning increasing numbers of storms, temperature and sea-level changes are threatening coral reefs and the ocean-atmosphere systems is varying in ways we only partially understand. While governments are deciding whether they can afford to second a staff member to the Commission for pollution, the quality of coastal waters is declining to unacceptable levels in many populated areas. I could go on but the message is clear, action is required sooner rather than later. One final point however, it is obvious to any participant at intergovernmental

meetings outside UNESCO, that most delegates there are ignorant of our Commission, its programmes and administration. This ignorance must be corrected, the IOC may be small but it is not ineffectual, we can offer forty years of experience and progress in intergovernmental marine science and programmes, our capability should be built upon, not ignored. However, it is a goal that will require each of you to assist the Executive Secretary and the next Chairperson to continue the promotion of the IOC and its programmes at every opportunity.

I should finish my welcoming speech on a positive note, and that is easy to do because we have been making progress. During the past four years, the Global Ocean Observing System,one of our flagship programmes, has seen increased acceptance and has responded on many fronts. Regional interest in GOOS has been evidenced from the proliferation of regional activities all around the globe. The Commission has taken its message to UNCSD, to the Conference of the Parties on the Framework Convention on Climate Change, to the UNEP Executive Council and to the WMO Congress. We are raising our coordination with our sister organization the WMO to a new level with the endorsement of a Joint Technical Commission, JCOMM. We have recommendations to modernize our Statutes. The Commission has embraced the electronic communication age and is bringing its information and data exchange up to date under IODE, and you can read all about these and many other activities in the IOC 1998 Annual Report.

The twentieth session of the Assembly is an unusual governing body meeting, in that we have tried to reduce the length of time for the meeting from the traditional three weeks to just two. How successful this experiment will be depends very much on yourselves, the discipline we can maintain and our ability to focus the discussions on decisions for each agenda item. I will be requesting interventions to be kept as brief as possible,and that includes my own remarks, so I will conclude with a final message. It is the responsibility of yourselves, as Member States, to ensure ocean policies are coordinated within your respective countries and that consistent positions are adopted in any intergovernmental forum concerned with marine matters that you attend. Please remember that the efforts of your Executive Secretary, his staff and the officers that you will elect later in the week cannot succeed without the continuing attention and support of yourselves as Member States. Thank you.

B. Opening Address
Dr P. Bernal, Executive Secretary IOC

on 29 June 1999

Mr Chairman, Distinguished Delegates, Colleagues, Ladies and Gentlemen,

First of all, on behalf of the Director-General, Mr Federico Mayor, and my colleague, Assistant Director-General for Natural Sciences, Dr Maurizio Iaccarino, I would like to offer to you a very warm welcome to this house, the house of IOC and UNESCO. The reason why my colleagues cannot be with us is that, during these days, the World Conference on Sciences is taking place in Budapest, organized jointly by UNESCO and ICSU.

Science is at the core of UNESCO's mission. It is the reason why IOC was created as part of UNESCO. However, since the establishment of the Commission 40 years ago, many things have

changed. I intend to address here some of these changes affecting the functioning of the UN system in general, and the IOC in particular.

The year 1998 will be remembered as the International Year of the Ocean. For IOC, this was an extraordinary opportunity to rally the support of the common citizen for the immense task we have before us as our mission: to develop the knowledge base to make possible the sustainable use of the world ocean.

Although IOC's mandate, as part of UNESCO, is solidly based in science, our work is not bounded by the traditional limits of the scientific endeavour. The ocean has always had some societal use, but imperfect regulations and insufficient institutional arrangements today put those uses at risk. This is a major concern for all Member States of UNESCO and IOC.

In the last three decades of this century, environmental issues have moved from the sidelines to the centre of the political scene. Since the adoption of the paradigm of Sustainable Development in 1992 in Rio de Janeiro, environmental issues are becoming central to the process of governing. This is a significant political transformation, that has been propelled by an emerging awareness of citizens in every nation of the world. This is a striking change.

On land, political accountability in environmental matters is ensured by the institutional presence of the national state. But this is not so clear for most of the world ocean. This was stressed in the message sent by the IOC to the Ministerial Segment CSD-7: *"The oceans are a global commons and as such require an integrated approach by governments"*. If we could learn from the experience of fishery management, we should remember that, when you have a *commons,* you might end with a *tragedy*.

This is why I think that the United Nations Convention on the Law of the Sea represents such an important achievement. It took more than 20 years to agree on a text that actually represents a true Constitution for the Ocean. It also took thirty years to make possible new environmental global conventions: the Convention on Biodiversity, the Framework Convention on Climate Change, The Montreal Protocol, adopted in the nineties. However, the constituencies that participate in the environmental convention, the constituencies that are present at each Conference of the Parties, have been absent in the existing *fora* on the ocean. This is certainly a limitation, but there are some hopeful signs.

Within the UN, several proposals aim at improving the quality and level of the reporting and discussion of ocean issues. At the same time, the possibility of using available knowledge in new applications, increasing the value of knowledge and information on ocean processes, has opened the way for the creation of global partnerships between the different users of the ocean.

Some scholars have said that we are living in a special moment in the institutional evolution of the world. I would like to quote from a very interesting book recently published by Susan Buck: "The Global Commons"[1] . In Chapter 1, she says: *"Some scholars have suggested that recent developments in international law foreshadow remarkable societal change. B.V.A. Roling recognizes the current era as a* ***"Grotian Moment"*** [named after Hugo Grotius, the Dutch jurist and humanist that developed the theory of **"res nullis"** for the high seas] : *a time in which a*

[1]Susan J. Buck (1998), *The Global Commons, An Introduction*, London, Earthscan Publ.

fundamental change of circumstances [creates] the need for a different world structure and a different international law"[2] .

Others scholars concur with the idea that the late twentieth century is a time of fundamental change. Global issues are raising a new consciousness in citizens of all nations. This should result in improved global institutions, accountable through the democratic participation of global citizens of the next millennium. I firmly believe that IOC and UNESCO have a fundamental role to play in this transcendental task.

C. Statement on behalf of the President of WMO, Dr J.W. Zillman

Speaking on behalf of the President of WMO, Dr J.W. Zillman, the WMO Secretariat representative offered the sincere apologies of Dr Zillman for being unable to address the Assembly in person, because of other commitments. He reaffirmed the strong personal commitment of Dr Zillman to the IOC/WMO partnership, and assured the Assembly that the WMO President would continue to work hard in support of this partnership during his new four-year mandate.

The Assembly was further informed that Dr Zillman had participated in the recent World Science Conference in Budapest. During this conference, many national delegations had stressed the importance of the "new social contract" between science and society, which closely links science and applications together with enhanced interdisciplinary co-operation, in the service of society. Dr Zillman noted that this emphasis was very much in line with the central feacture of the IOC/WMO partnership, reflected in activities such as JCOMM, which specifically addresses both the applications of science and has the advantages of interdisciplinarity.

The World Science Conference had also endorsed the concept of the free and unrestricted exchange of scientific data, in terms which closely reflected those of Resolution 40 (WMO Cg-XII).

The WMO policy practice regarding data exchange covers primarily meteorological and hydrological data, and in this context Dr Zillman underlined the potential value of IOC committing itself to a similar formal policy statement regarding the free and unrestricted exchange of oceanographic data.

Finally, the Assembly was assured of the personal optimism of Dr Zillman for the approach to IOC/WMO co-operation enbodied in the JCOMM initiative, and of the resolve of WMO to work even more closely with IOC in the future on issues of common interest.

[2]Rolling credits Richard Falk for the term Grotian Moment. Falk, R (1983), On the recent further decline of International Law, in: A. R. Blackshield (ed.), *Legal Change: Essays in Honour of Julius Stone*, Sidney, Australia, p. 272. (cited by S. Buck)

ANNEX IV

INITIAL GOOS COMMITMENTS MEETING
(July 5-6, 1999, UNESCO, Paris)

1. BACKGROUND

The Initial GOOS Commitments Meeting was an important early stage in the implementation of GOOS, and one which would enable the present GOOS Initial Observing System to grow by the addition of national components.

The meeting took place in response to IOC Circular Letter No. 1606 (16 April 1999) which invited Member States of IOC and representatives of their marine agencies and other bodies with an interest in GOOS to participate in an Initial GOOS Commitments Meeting, shortly after the Fourth Session of the Intergovernmental Committee on GOOS (I-GOOS) on the 23rd to 25th of June 1999, and concurrently with the Twentieth Session of IOC Assembly.

This meeting followed recommendations made at I-GOOS-III (Paris, June 1998), and the Nineteenth Session of the IOC Assembly (Paris, July 1998), and anticipated Resolution XX-7 of the Assembly concerning the IOC endorsement of an Agreement to the GOOS Principles and Plans, which urged Member States to contribute to GOOS implementation within the context of available resources and government policies. The meeting also addressed the call by the Fourth Conference of the Parties to the Framework Convention on Climate Change (Buenos Aires, November 1998), urging parties to actively support national oceanographic systems in support of climate observations *via* GOOS and GCOS, and to make, to the extent possible, an increase in the number of ocean observations, particularly in remote locations, and to establish and maintain reference stations.

Representatives of 20 countries and 5 organizations attended the meeting. In addition two countries (Seychelles and Spain) submitted written statements (Spain was represented at the meeting by the Director of EuroGOOS). Of the 22 countries attending or submitting information, seventeen were involved in presentations at the meeting, as were three of the organizations (EuroGOOS, EUMETSAT and SAHFOS).

The presentations indicated a variety of forms of GOOS participation. They ranged from a selection of existing national observing activities from which a subset of data would be contributed to GOOS, to detailed specifications of contributions of financial and other support for GOOS activities as well as participation in GOOS-related projects and experiments. Many of the countries represented had put in place mechanisms for national co-ordination such as GOOS Co-ordinating Committees.

2. SUMMARY OF PRESENT COMMITMENTS

These commitments are extracted from those more fully expressed in the national contributions that will be published in the full report of the meeting. In assessing them the reader should note that many countries are not yet represented, and that even for those countries who did make contributions those contributions may not represent all agencies in those countries. There is ample opportunity for further contributions to be made from the countries that attended the meeting, or from others.

2.1 Global Ocean Level (Climate Module)

- Operational El Niño observing and forecasting [Australia, USA]

- TRITON moored buoy network in the equatorial Pacific [Japan]
- GOOS and ENSO related research in the equatorial Pacific and Kuroshio regions [Japan]

- PIRATA (extension of TAO to the Atlantic) [Brazil, France, USA]

- Maintain existing arrays monitoring change in ocean structure [Australia]

- Operationalize SOOP network, and/or maintain involvement in SOOP and/or VOS lines [Australia, France, Germany, Japan, Netherlands, Russia, USA]

- Establish COOE (Co-operative Ocean Observing Experiment) [Australia]

- Antarctic observation programme (XBTs, buoys, tide-gauges, sea-ice measurements) [Australia]

- National Buoy Programmes of drifting and moored buoys, usually including continued contribution to DBCP [Brazil, France, India, Japan, Netherlands, UK, USA]

- Time series stations (i) off Canary Islands) [Spain and EC partners], (ii) at the site of OWS P in the Pacific, and the site of OWS BRAVO in the Atlantic [Canada], and (iii) at the HOTS (Hawaii) and BATS (Bermuda) sites [USA]

- Repeat hydrographic sections (i) on Line P in the Pacific, and on the Labrador section in the Atlantic [Canada]; (ii) of waters around Scotland [UK], (iii) of the Ireland to Greenland section [Netherlands], and (iv) across the North Atlantic to monitor heat transport by N. Atlantic Current [Germany]

- GODAE [Australia, USA]; implementing MERCATOR project as contribution to GODAE [France]; and involvement in the European component ESODAE [Netherlands]

- Remote-sensing satellites, for topography/altimetry (TOPEX/POSEIDON) [France, USA], ocean colour [India, Japan, USA], sea surface temperature [India, USA] and winds [Japan, USA]

- Acoustic Thermometry of Ocean Climate [Russia]

- Monitoring ocean-atmosphere interaction [Russia]

- Global data on SST distribution [Russia]

2.2 Living Marine Resources Module

- Continuous Plankton Recorder profiling [Australia]

- Observations of whales, seals seabirds, fish stocks in the Southern Ocean [Australia]

- Great Barrier Reef Monitoring programme [Australia], and other coral reef monitoring [Japan, USA]

- Algaline operational ecosystem monitoring of the Baltic [Finland], and biological monitoring of the Baltic [Germany]

- Long-term zooplankton recording at Heligoland [Germany], and monitoring phytoplankton and algal blooms by the Nansen Centre [Norway]

- Composition of sublittoral macrobenthos [Germany], and mapping seabed communities near-shore [UK], and marine biological environments near-shore [Japan]

- Biological monitoring of fish stocks [Germany, Japan, UK, USA]

- Marine ecosystem monitoring [Seychelles]

2.3 Health of the Ocean Module

- Monitoring pelagic plastics [Australia]

- National water quality network [France, Japan]

- Coastal Ocean Monitoring and Prediction System (COMAPS) [India]

- Marine pollution monitoring of coastal waters [Japan]

- North Sea and Baltic monitoring programmes (contribution to OSPAR and HELCOM) [Germany], assessment of the state of the Baltic [Russia] and Baltic monitoring in Baltic-GOOS [Sweden]

- Monitoring oil slicks [Japan, Norway]

- Harmful algal bloom monitoring [Spain]

- Black Sea GOOS Project [Russia and partners]

- Monitoring quality of marine environment near sites of industrial discharge [UK]

- Mussel Watch [Japan, USA]

2.4 Coastal Module

- Sea-level monitoring network, usually in addition to maintaining tide gauge stations of GLOSS [Brazil, Chile, France, India, Japan, Russia, Spain, USA]

- Meteorological coastal stations [Brazil], and meteorological buoy network [Spain]

- Oceanographic and marine meteorological surveys [Japan]

- Atlantic, Pacific and Arctic Ocean monitoring programmes [Canada]

- Coastal buoys and fixed stations [USA]

- Specific regional coastal studies (CALCOFI, Gulf of Maine, Chesapeake Bay programme, S. Florida ecosystem restoration) [USA]

- North Sea and Baltic (MARNET) automated monitoring network (10 stations) including Met data [Germany], and network of fixed observation stations in the North Sea [Netherlands]

- Federal states agencies coastal monitoring programmes [Germany]

- Ocean wave information network [Japan]

- PORTS programme [USA]

- Wave buoy network, wave remote measuring, and wave forecasting programme [Russia, Spain]

- Storm surge forecasts [Germany, Russia, Spain, UK]

- Tsunami forecast [Japan, USA]

2.5 All aspects of coastal seas

- Operational oceanographic services (e.g. including sea state and ice conditions) [Germany]

- Marine meteorological observation service at sea [Germany]

- Environmental observing system of Institute of Marine Research (IMR)[Norway]

- Observations and services of the Marine Forecasting Centre of Norwegian Meteorological Institute (DNMI) [Norway]

- Nansen Centre products and services including: ocean fronts, jets and winds, ice information, and ocean modelling and data assimilation [Norway]

- Operational hydro-meteorological services in Arctic and Antarctic [Russia]

- Marine meteorological analyses and forecasts including ice conditions [Russia]

- Coastal monitoring programme assess vulnerability of low-lying areas to flooding and sea-level rise [Japan, UK]

- Ship routing services [UK]

2.6 Data and Information Management

- Expand quantity and types of data and information exchanged through the Internet in NEAR-GOOS [China, Japan, Russia]

- Operate NEAR-GOOS real-time database at JMA, and NEAR-GOOS delayed mode data base at JODC [Japan]

- Data management through NODCs [France, Germany, Japan], or Designated National Agencies [Seychelles]

- Data Management (e.g. of GTSPP) through Marine Environmental Data Service (MEDS) [Canada]

- Special Ocean Data Centre for IGOSS in Météo-France, Toulouse [France]

- IGOSS specialised ocean centre for the Pacific [Japan]

- GOOS Data Centre [USA]

- Global Collecting Centre for marine meteorological data [Germany]

- Global Precipitation Climatology Centre [Germany]

- Marine information products and services [India]

- Sea-ice information system [Japan, Russia]

2.7 Co-ordination, Policy and Infrastructure

- National Ocean Policy [Australia]

- National Ocean Conference [USA]

- Developed and published Policy Proposal for Improved Monitoring of System Earth [Netherlands]

- Developed and published outline US Plan for Integrated Sustained Ocean Observing System [USA]

- Establish GODAE Bureau in Melbourne [Australia]

- Support for IOC GOOS Office in Perth [Australia]

- Establish Joint Australian Facility for Ocean Observing Systems [Australia]

- Partnership for Observing the Global Oceans (POGO) formed [USA, UK, France, Germany, Japan]

- National GOOS Co-ordinating Committee [Brazil, India, Norway, UK, USA]

- National workshops and newsletter on NEAR-GOOS data, to better serve users [China]

- Development of Space Oceanology [Russia]

2.8 Financial

- US$45,000/yr for 3 years for C-GOOS, LOICZ links and capacity building [Netherlands]

- US$10,000/yr for GLOSS [UK]

  Sida/SAREC funding for specified GOOS activities [Sweden]

3. SUMMARY OF PLANNED OR POSSIBLE FUTURE COMMITMENTS

3.1 Global Level (Climate Module)

- Implement an Australian Ocean Observing System (AOOS) [Australia]

- Augment buoy programmes in S.W. Atlantic [Brazil] and S.E. Pacific [Chile]

- Increase deployment of drifting buoys [Brazil]

  Automate several Met stations on coast and on St. Peter and St. Paul islands for real-time data transmission [Brazil]

- Increase use of SOOP for subsurface data [Brazil]

- Seasonal sampling using time series stations and hydrographic sections [Canada]

- Substantial contribution of floats to Argo [Australia, Canada, France, Germany, USA]

- Trans-ocean sections off East and West coasts every 8 years to assess transports of heat, freshwater and carbon [Canada]

- Observations of transport on Labrador shelf and through Canadian Archipelago [Canada]

- Launch of new remote sensing satellites, for altimetry (JASON) [France], ocean colour [China], and environment (NPOESS) [USA]

- Satellite gravity and salinity [USA]

- TRITON moored buoy programme in the equatorial Indian Ocean [Japan]

- Start operational ENSO forecasting [Japan]

- Design and implement CORIOLIS Project for observing the Atlantic, to contribute to (i) PIRATA, (ii) continuation of SOOP lines in the Atlantic, (iii) maintenance of involvement of DBCP, (iv) Argo, and (v) EMMA pop-up profilers [France]

- Develop ocean monitoring system for climate change forecasting [Russia]

- Network of Global Eulerian Observatories (time series stations) [USA]

- CLIVAR basin-scale studies [Netherlands, USA]

3.2 Living Marine Resources Module

- Enhance ecological monitoring of Great Barrier Reef and N.W. Shelf, and other areas [Australia]

- Analyse harmful algal blooms [Brazil]

3.3 Health of the Ocean Module

- Monitor (i) contaminant discharges and ocean health indicators in S.W. Atlantic, (ii) solids in suspension on continental shelf, (iii) accumulation of garbage along beaches, and (iv) chemical pollutants in the atmosphere over the Atlantic [Brazil]

- MAREL moored automated water quality system [France]

- Coastal Index Sites; long-term ecological research sites [USA]

3.4 Coastal Module

- Automate several tide gauges [Brazil], and enhance the tide gauge network [Canada], including adding 2 new tide gauges in Arctic and Labrador for climate purposes [Canada]

- Sea ice off Labrador, in Canadian Arctic and in St. Lawrence [Canada]

- Participation in Black Sea GOOS, and development of regional pilot projects for the Baltic and Arctic in conjunction with EuroGOOS [Russia]

- Instrumentation of ferries as part of the EuroGOOS programme [Netherlands]

3.5 All aspects of coastal seas

- Further development of operational marine meteorological and oceanographic services [China, Russia]

- Further develop space-based observing systems, acoustical and buoy technologies for ocean monitoring [Russia]

- A network of coastal laboratories and programmes (LabNet) [USA]

- Instrumentation of yachts as SOOPs by the International Sea-Keepers' Society [USA]

3.6 Data and Information Management

- Develop data assimilation models [Australia]

- Improve national data co-ordination [Australia]

- Incorporate industry-generated data into monitoring statistics [Australia]

- Create GOOS-focussed data management system [Brazil]

- Prepare oceanographic climatic atlases, charts and guides for shipping [Russia]

- Improve system for oceanographic data/information exchange [Russia]

3.7 Co-ordination, Policy and Infrastructure

- Upgrade research/survey vessels [Australia]

- Refurbish existing and establish new coastal and island research stations in southern temperate and north-east tropical waters [Australia]

- World Water Forum and Ministerial Conference, The Hague, 2000 [Netherlands]

3.8 Financial

- Starting in 2000, US$19,000 (=£12,000)/ yr for 3 years for biological aspects [UK]

- Anticipate improved contribution to Capacity Building for GOOS [Netherlands]

ANNEX V

LECTURES

A. THE BRUUN MEMORIAL LECTURE

Ocean Predictability

by

John Woods
Professor of Oceanography at Imperial College, London

Summary[1]

The lecture started by addressing the following questions. Why should we want to predict the ocean? What are the expected socio-economic benefits? How in principle might it be done? How can we best combine models and data at a local level and globally? How will the transient motions of the weather inside the ocean limit predictability? Does chaos theory set any theoretical limits, and if so what are they? More pragmatically, what are the practical limits to ocean prediction? Following that introduction the lecture reviewed the status of ocean prediction at the end of the 20th century and consider the prospects for the next century. The emphasis was on practical methods and on the real issues confronting those involved in developing ocean prediction around the world. It considered the role of the Global Ocean Observing System (GOOS) promoted by the IOC and associated regional programmes like EuroGOOS.

John Woods is professor of oceanography at Imperial College, honorary professor of oceanography at Southampton University, fellow of the Plymouth Marine Laboratory, fellow of Linacre College Oxford University, and foundation member of the Academia Europaea. From 1986-1994 he was Director of Marine and Atmospheric Sciences at the UK Natural Environment Research Council. Before that was a research fellow at the Meteorological Office(1966-72), and was professor of oceanography at Southampton University(1972-77) and Kiel University (1977-86). He has contributed to the development of GOOS, as a member of the Joint Committee, where he was responsible for the Prospectus: GOOS 1998. He is President of EuroGOOS. From 1995-1998 he was a member of GEF STAP, where he chaired the International Waters section. He has served on the steering committees of anumber of international scientific programmes, including GARP, WCRP, WOCEand IGBP. His work has been recognized by a number of awards including honorary doctorates from: Liege & Plymouth universities; prizes from: M.D,Royal Geographic Society, Royal Meterological Society; and in 1995 the Queen made him CBE. Professor Woods's research interests include ocean forecasting and plankton ecology.

[1] The text of the Bruun Memorial Lecture will be edited and published separately.

B. Dr N.K. PANIKKAR MEMORIAL LECTURE

Tsunami Numerical Simulation
A Powerful Means to Understand Tsunamis and to Prepare for Tsunami Disasters

by
SHUTO Nobuo
Professor at Iwate Prefectural University, Iwate, Japan

Summary

Tsunami is an infrequent natural phenomenon. Accordingly, good data are scarce, even if they are qualitative. Almost no quantitative data are available. It is quite difficult to understand actual faces of tsunami.

It is also difficult to continue lessons of disaster to the future generation, because the return period of huge tsunami is longer than a life span of human. Coastal residents easily forget experiences of their ancestor. Societies in the coastal region may change before another tsunami. Then, the next tsunami will devastate the coastal regions again. Tsunamis, in this way, claim human lives and damage human properties repeatedly.

A powerful means, tsunami numerical simulation, appeared about 35 years ago. It has been developed and is now used in several fields in research and practice. Seismology made the first breakthrough, i.e., the method of estimation of tsunami initial profile. Development of high-speed computer made it possible to calculate tsunamis over wide areas.

Tsunami numerical simulation is used for many purposes at present. In many countries, hazard maps are made with numerical simulation. Computation is used as the basis of design of disaster prevention structures. Since the 1992 Nicaraguan tsunami, numerical results have been distributed to international tsunami survey teams to prepare well before the field survey. Computer-aided animation is used to understand movement of tsunamis in research and are also used in public education. A remarkable example is the JMA's new tsunami forecasting which began last April. Results of 100,000 simulations replaced an empirical relationship in judgment of tsunami magnitude.

On the other hand, a vital defect in computation has been recognized more and more strongly. It is the accuracy in estimation of initial profile. In the worst case, there is an error of 200 to 250 percent. For the future development, we need the second breakthrough, a method to determine accurate initial profiles. This will be given through numerous, high-quality measurements in deep sea at and near the place of birth of tsunamis.

Dr Shuto Nobuo, is Doctor of Engineering, and presently professor at the Faculty of Policy Studies of Iwate Prefectural University. From 1977 to 1998 he was Professor at the Faculty of Engineering at Tohoku University and in 1990 worked at the Disaster Control Research Centre of this university.

Between 1991 and 1998, he was the Director of the Centre of the TIME Project (IUGG/IOC joint project in IDNDR) in the University of Tokyo. Between 1987 and 1998, Dr Shuto was Vice-

chairman of the Tsunami Commission of the International Union of Geodesy and Geophysics (IUGG).

He was awarded by the Japan Society of Civil Engineering for its papers *Runup of Long Waves* (1967), and *Highly Accurate Numerical Tsunami Forecasting for Local Tsunamis* (1989). In 1991, he received the W.M. Award from the Tsunami Society for outstanding long-term contribution to research on tsunami, and in 1996 he gained the International Coastal Engineering Award by the American Society of Civil Engineers, in recognition of his pivotal roles and world-wide leadership over past 30 years in the research of tsunamis.

ANNEX VI

NATIONAL REPORTS ON INTERSESSIONAL ACTIVITIES

A. BRAZIL

Ocean Sciences

Brazil participated in the Fourth Session of the IPHAB (Intergovernmental panel on **HAB**), held in Vigo, Spain. Brazil was also represented at the Third Session of the IOC-FANSA Regional Working Group on Harmful Algal Blooms in South America, in Punta Arenas, Chile. A questionnaire about harmful blooms in Brazil was sent, upon request, to the IOC-ICES Working Group on Harmful Algal Bloom Dynamics, to integrate a map with all data available on world HAB events. These data were compiled during the meeting of the Working Group in Lisbon, March 98. A Brazilian researcher participated in a training course on culture techniques of Harmful species at the IOC Science and Communication Centre on HAB in Vigo, and then in another course and training period in the IOC HAB Centre in Copenhagen, Denmark. In October 98, was held in Itajaí, SC, the First Brazilian Colloquium on Harmful Algae, where scientists from Universities, Sanitary institutions, students, had the opportunity to evaluate and discuss the problem at national levels. A Brazilian Ph.D. student is doing part of her doctorate project at Don Anderson's laboratory, at Woods Hole Oceanographic Institution (USA). The next meeting of the regional South American Working Group on HAB is due to be held at the Fundação Universidade do Rio Grande (FURG), Rio Grande (RS), Brazil, at the end of this year.

Brazilian experts in marine pollution involved with the **GIPME** Programme are running the Second Intercalibration Exercise, involving salinity, nitrite, nitrate and phosphate. These parameters were chosen based on their importance concerning the contemporary view of marine pollution and the Instituto de Estudos Almirante Paulo Moreira (IEAPM), at Rio de Janeiro, is producing internal reference material which is distributed to the participants. More than 20 labs are involved in this intercalibration exercise.

Brazil recognizes the importance of the **CLIVAR** Programme and its applicability. Three seniors researchers participated of the First International CLIVAR Conference, and a reference document entitled CLIVAR/Brazil was elaborated, and now needs to be detailed on project activities. Brazil is willing to participate of the coming OCEANOBS '99 Conference, scheduled to October, in France. Brazil express its appreciation for the inclusion of the South Atlantic on the item "Regional Approaches".

Within the framework of the World Ocean Circulation Experiment (**WOCE**), the Brazil Basin was chosen for regional investigations on a gyre scale, in particular, to determine and to quantify the sub-thermocline circulation and associated mixing between boundary currents and the interior on eddy-revolving scale. Among the methods to be applied were direct current measurements with moored current meters, surface and sub-surface drifters (floats), repeated hydrographic sections and remote sensing data analysis. This part of WOCE was called the Deep Basin Experiment (DBE). As Brazilian contribution to the DBE, the COROAS (Circulação Oceânica na Região Oeste do Atlântico Sul) project was conducted in the years 1992 to 1999. Its objectives were: to estimate the baroclinic and barotropic components of the circulation along the Brazilian coast, including the continental shelf and the shelf break regions, between Ubatuba (SP) and Cananéia (SP); to continuously monitor the velocity field and the heat and mass transports of the Brazil Current (BC) and the Antarctic Intermediate Water (AAIW), along the southeastern Brazilian coast; to determine the importance of meso-scale vortices in the heat and mass transports

in the Brazil Current; to determine the response of the continental shelf water to the forcing represented by intrusions of the BC and AAIW, including the study of the influence of the Brazil Current eddies in the renovation of the continental shelf water; and to study the deep circulation in the Brazil Basin, including its interaction with the Argentine Basin. Its principal investigators were from the Oceanographic Institute of the University of São Paulo (IO-USP), and the INPE - National Institute of Space Research.

The **OSNLR** Programme was very active despite some financial problems. A project about the mineral resources of northeast Brazil was developed with financial support of the Organization of American States (OAS). The results of this study were published by L. R. Martins and C. I. Santana (editors): *Non Living Resources of the Southern Brazilian Coastal Zone and Continental Margin* (110 pp.). A map of the mineral resources of the Brazilian Continental Margins and Adjacent Regions is also furnished. The COMEMIR/CZAR group developed several studies about coastal erosion and sea-level changes in the pilot area of Cabo Frio (RJ) to Chuí (RS). Some of these results were published. Within the OSNLR/TEMA activities, a Management on Coastal Zone course was held at Recife (PE), with the help of the University of Barcelona, for 30 graduate students of the northeast Brazil. Results of OSNLR projects were presented at international congress, such as the First Latin American Sedimentological Congress (Venezuela, November 97) and International Sedimentological Congress (Spain, April 98). OSNLR Brazil continued its collaboration with the International Course on Oceanography (graduate level), in Concepción, Chile, under the UNITWIN programme, giving the classes of marine and coastal geology.

Ocean Services

Brazil continued to perform systematic measurements, through activities of sea-level monitoring (**GLOSS**), the Pilot Research moored Array in the Tropical Atlantic (**GOOS/PIRATA**), the National Buoy Programme (**DBCP/ISABP**), and environmental monitoring in some coastal areas.

Brazil continues its efforts to implement the **GOOS** Programme at national level, through its Executive Committee in accordance to the GOOS Principles. Brazil looks forward to the implementation of a GOOS regional project under the umbrella of the ASOS Co-operation. Brazil expects to have a parallel meeting on this matter during the Capacity Building Workshop for Latin America, planned to next year.

Concerning the **IODE** Programme, Brazil continues with the exchange of data, and new technology is being used. Brazil continues also its involvement at **GEBCO** activities.

Under the **GLOSS/TEMA**, a training course is scheduled to August/September 1999, at the Oceanographic Institute of the University of São Paulo.

Secondment

Brazil extended for one more year (May 2000) the secondment of Mrs Janice Trotte to IOC Secretariat - GOOS Project Office.

B. CANADA

Canada's vision is for healthy, safe and productive oceans for the benefit of present and future Canadians and the world. Canada recognizes the global importance of oceans and is committed to the conservation, protection and sustainable development of oceans and oceans resources worldwide. Over the last several years, Canada has been very active in areas of ocean development and management.

Canada's *Oceans Act* became law in January 1997. The Act is based on principles of sustainable development, integrated management and a precautionary and ecosystems approach to management. It includes authority to establish marine protected areas, the enforcement of marine environment quality guidelines, criteria and standards designed to conserve and protect ecosystem health and the development of management plans, within an integrated management structure. Powers include the provision of services and of marine scientific advice supporting ocean management responsibilities.

Current fishing techniques are having a serious impact on traditional and non-traditional fisheries in Canada and in other parts of the world. Irresponsible fishing practices affect the abundance of stocks and result in unacceptable waste. Canada will promote its public and private sector marine expertise relating to fisheries management, habitat mapping, aquaculture and sustainable harvesting practices.

Degradation of the marine environment is a global problem that needs a concerted international and national effort. There are considerable social and economic pressures involved. The impacts of pollution from land-based sources include shellfish closures, degraded beaches, destroyed fish habitat and contaminated sites. Protection of the marine environment from land-based activities is dependent on integrated and co-ordinated action. In Canada as elsewhere, the coastal zone is the marine area of highest resource-use conflicts, the greatest concentration and diversity of critical habitats, and the most serious threats to human health and marine life from land-based activities. Canada's National Programme of Action (NPA) meets our commitment to protect the marine environment from land-based activities under the Global Programme of Action.

There is a need to take an integrated approach to oceans activities, in Canada and around the world. The process should be based on conservation, an ecosystem approach, sustainable use of coastal resources and economic diversification. Marine Protected Areas provide a powerful and proven tool for achieving conservation objectives in the marine environment. Through MPAs we can begin to protect important ecosystems and species, thereby protecting the marine environment and resources upon which our coastal communities depend. Canada has recently announced the establishment of five pilot marine protected areas, and proposed to announce others in the coming year.

The management of Canada's coastal and ocean waters is a shared responsibility. For this reason, Canada is in the process of developing a National Strategy for Oceans Management, offering the opportunity to harness the talents and experience of stakeholders in developing oceans management solutions. The strategy also recognizes a need to integrate the management of coastal zones and river basins and watersheds.

The oceans play an integral role in the Earth's climate. Climate change will affect the availability of water, the planetary food supply, the distribution of pests and disease vectors, the

survival of species, the fisheries and forest industries and the occurrence of natural disasters. For Canada, in a northern temperature zone, the understanding of the impact of climate change is of fundamental importance to the national security and economy. Canada will work with international research and monitoring programmes aimed at a better understanding of the Earth's natural climate system and the influence from human activities.

Canada is both proud of and concerned about its ocean environment and the resources it contains. National policies are being developed and actions undertaken to strengthen the legal, programme and administrative framework on which the stewardship of the ocean depends. However the ocean is part of the global commons and national action is meaningless if undertaken in isolation. Therefore Canada will continue to work with and support international and intergovernmental efforts in ocean science and services.

C. GERMANY

Germany, within the IOC of UNESCO, attributes high priority to operational oceanography and to training, education and mutual assistance. An intergovernmental body like the IOC is being viewed as the right mechanism to establish activities which lead to meeting marine environmental and societal pressing needs.

International Year of the Ocean (IYO)

Intensive activities were undertaken by Germany to strengthen the awareness of the public for the impact the ocean has on human life and for the preservation of the marine environment. Unions, associations, agencies, oceanographic institutions, municipalities and the mass media took part in this initiative by holding workshop, symposia and seminars, by special ocean-related events, articles in the press as well as radio and TV programmes. 18 German pupils participated in an IYO contest. Some of them presented extremely well prepared papers on ocean issues. The contest was a big success.

The Bundesamt für Seeschiffahrt und Hydrographie (BSH) had opened an Internet page for the IYO which, *inter alia*, contained a calendar of the various German contributions.

Global Ocean Observing System (GOOS)

The BSH has been charged with the German GOOS Secretariat, and the German Weather Service (DWD) with the GCOS Secretariat.

The BSH has elaborated the initial German contribution to the Global Ocean Observing System (GOOS). In the next months the contribution will be published and presented to the IOC. Germany is going to contribute to all GOOS modules. A special paper on the German contribution to GOOS will be submitted to the IOC.

Ship-of-opportunity Programme (SOOP)

The German Ship-of-opportunity activities were confined to the North Atlantic Ocean. The BSH continued its SOOP programme on merchant ships along the line AX-3 (Europe-Halifax) and AX-11 (Europe-Brasil). Both SOOP lines provide data of a high timely and qualitative continuity,

and they show a remarkable length of records (AX-3: 11 years and AX-11: 18 years). The following XBT measurements down to 1.200 m depth were sampled:

AX-3: 9 transects with 522 temperature profiles;
AX-11: 8 transects with 450 temperature profiles.

On a more *ad hoc* basis, additional XBT measurements came from research vessels. The German navy contributes to the German ship-of-opportunity programme on an operational basis, i.e. data from the German navy are not older then 30 days. Their part is 30 % of all the German XBT data.

The BSH component for the collection of hourly sea-surface temperature data by merchant ships and exchange in the TRACKOB code was continued.

The continuation of SOOP becomes more and more difficult. One reason is the new generation of ships which have only one-man on the navigational bridge who does not have time to resease XBTs; the other reasons are the financial situation in Germany and the increasing price for XBT probes subject to the monopoly of the producer.

Climate related monitoring

A couple of years ago the BSH, as part of the World Ocean Circulation Experiment (WOCE), has started an oceanographic programme to monitor climate related changes in the North Atlantic Ocean. The last cruise of the research vessel *Gauss* took place from April 27 until June 18, 1998. She worked on two distinct transects in the transition zone between the subpolar and the subtropical gyre. These two transects are scientifically connected to the BSH XBT programme on SOOP line AX-3. They form the northerly and southerly boundary of the AX-3 measurement area.

The objectives of this BSH programme are to investigate the variability of the meridional overturning as well as of the transport of heat by the Northatlantic Current which has a drastic impact on the climate development in Europe.

The combined programme of XBT drops on SOOP line AX-3 and less frequent oceanographic transoceanic sections proved to be very successful for the monitoring of changes in an ocean basin.

International Oceanographic Data and Information Exchange (IODE)

The "Deutsches Ozeanographisches Datenzentrum" (DOD) as the National Oceanographic Data Centre (NODC) of Germany continued in the collection, distribution and promotion of marine data from Germany. In addition, DOD has special responsibility for managing the German environmental data for OSPAR in the North Sea and for HELCOM in the Baltic Sea.

A main task was the working up of older and recent CTD-data by reformatting them from more than 25 different formats into just one. Much work was to add missing meta information, and cross checking it with already archived bottle data in the data bank. Finally, a first submission of 133 cruises (more than 8000 stations) from 1977 – 1997 was sent to WDC-A, and to ICES. A second submission is planned for this year, completing the submission of all CTD-data available in the DOD. After that, the numerous outstanding CTDs will be tackled.

The satisfactory return of Cruise Summary Reports (CSR) continued in Germany, resulting in a submission of CSRs by the DOD to WDCs and ICES of 226 CSRs in February 1998 and 171 CSRs in February 1999. CSRs are loaded into the data bank covering more than 5,000 cruises. Inventories of it are updated quarterly on the Web.

CSR/ROSCOPS are under revision by DOD within the EU-funded project „European Network for Oceanographic Data & Information Management" (EURONODIM) aiming at demonstrating a proposal at IODE-XVI.

Training, Education and Mutual Assistance (TEMA)

In February 1998 a national Workshop on TEMA was held at the BSH. Representatives of ministries, federal and state agencies, research institutions and donor agencies participated in this first event of that kind in Germany. The international development of TEMA concepts and their importance to the Third World were stressed. TEMA activities contribute to an urgently needed global strengthening of marine sciences, to a useful implementation of the German development aid policy, and finally to the fulfillment of the German official duties resulting from the Convention of the Law of the Sea.

There was also unanimous agreement that the existing German administrative structures for development aid grants should be retained and not be replaced by a more centralized system. The workshop participants concluded that Germany should continue its TEMA activities and intensify, whenever possible. TEMA contributions should not be initiated and implemented by a donor offers only. It might be more helpful for the receiving country (or institution) to get support according to their individual needs. Thus, developing countries are invited to express their needs. Germany will take them into consideration for granting, to the extent possible.

The special publication *A Compilation of German Activities in Marine Sciences* will be presented to the Twentieth Session of the IOC Assembly.

Training Course on Qualitative and Quantitative Determination of Algal Toxins

The IOC-UNEP-German Training Course on Qualitative and Quantitative Determination of Algal Toxins was held at the Friedrich -Schiller-Universität Jena, Germany from March 2-12, 1999. The course was jointly sponsored by IOC and UNEP, and organized in the framework of the HAB programmes. Furthermore, Germany (the Government of the state Thuringia), Carl Zeiss, Germany; Schott Jenaer Glas, Germany; and Shimadzu, Germany supported the course. The 17 participants originated from 16 countries.

The goal of the course was to provide the participants with an overview of the state of the art of different analytical methods for qualitative as well as for quantitative determination of phycotoxins. Lectures and demonstrations on all relevant toxins were performed, and the participants were encouraged to establish scientific collaboration. During various roundtable discussions the need for international reference material and standards was stressed. Currently standards are available only on few toxins. The necessity was stressed to improve the methods for non-ambiguous determination of the different algal toxins in order to evaluate possible hazards originating from seafood and drinking waters contaminated by phycotoxins.

International Bathymetric Chart of the Western Indian Ocean (IBCWIO)

For long it is planned by IOC to prepare and publish, with the assistance of Member countries, a set of 21 International Bathymetric Charts of the Western Indian Ocean (IBCWIO). Chief Editor of the IBCWIO Project is Prof. Bettac (Germany). The first Chart (No. 04) has now been printed by the Bundesamt für Seeschiffahrt und Hydrographie (BSH). The scale of the charts is 1 : 1.000.000.

The first chart will be delivered by the Head of the German Delegation to the Chairman of the 20th Session of the IOC Assembly. The second chart, also printed by the BSH, will be available in August 1999. The remaining charts will be published by other countries.

Representation in IOC Bodies

German scientists work in many IOC panels. The German delegation would like to see the IOC Secretariat inviting Member States to nominate experts for groups of experts rather than selecting them without consultating of the States.

D. INDIA

Introduction

The Ocean Science and Technology programmes of India are based on the Ocean Policy Statement enunciated by the Government in 1982 and responsive to global developments in the ocean sector. Currently the programmes are directed towards:

- Exploration of marine living and non living resources, and techno-economic studies to evolve strategies for sustained utilization of resources;

- Capacity building through basic scientific research, human resource development and developing centres of excellences;

- Technology development for future applications of industrial and economic significance;

- Societal programmes delivering benefits to the community and coastal area developments;

- Creation of public awareness of the ocean, its potential and uses.

Ocean observation and Information Services

Recognising the importance of oceanographic data and data products for scientific research and technology development, India recently established a programme on "Ocean Observation and Information Services". It is planned to generate and supply application oriented and user driven oceanographic data and data products for different user agencies such as ports and harbours, shipping and fisheries development, weather and climate forecast, assessment of environment, coastal zone development and management as well as promotion of advanced research in oceanography. These are in line with the GOOS programme of IOC. Conventional and satellite remote sensing observations are effectively used in this programme.

Oceansat-I and ground validation

Oceansat-I, India's first remote sensing satellite for oceanographic studies was launched on 26th May 1999 with Multi-frequency Scanning Microwave Radiometer and Ocean Colour Monitor pay loads. As a precursor, India had an year earlier established an operational Met Ocean buoy programme with 12 state-of-the-art moored buoys within and outside Indian waters. Other on-going oceanographic observations continue with drifting buoys, expendable bathythermographs, current meters, tide gauges, etc.

Coastal Zone Studies

Last year India initiated an Integrated Coastal and Marine Area Management programme for capacity building in the marine environment sector and provides R&D support and training for coastal area development. Monitoring the health of India coastal waters continues through the measurement of 25 physical, chemical and biological parameters of the water column and seabed sediments. Transects are monitored up to a distance of 25 km normal to the coast. These data provide inputs when drawing up regulatory measures to protect the marine environment. Two coastal research vessels are deployed on this programme to monitor the entire coast line at selected locations.

Ocean Science and Technology

Scientific research and application oriented technology development are carried out in several national institutions including National Institute of Oceanography at Goa and National Institute of Ocean Technology at Chennai. On-going research programmes investigate near shore processes, geomorphology of coastal regions, ocean dynamics and modelling, air sea interaction, chemical constituents and their cycles in sea water, marine pollution, and geological features including structures and tectonics. The environmental consequences of acquaculture and mariculture, the correlation between oceanographic parameters and productivity of living resources and efforts to develop predictive capability and evolve measures for sustained utilization of living resources, are other on-going programmes.

In the ocean technology area, the technical feasibility of generation and supply of electric power was demonstrated by an experimental wave energy plant with oscillating water column. Further studies on techno-economic viability and applications as a remote source of power for island states, are in progress.

In 1998, a project on a closed cycle Ocean Thermal Energy Conversion (OTEC) experimental plant of 1 MW gross power, operating on Rankine Cycle with ammonia as a working fluid, utilizing the temperature difference between the warm surface water and the cold deep water at about 1,000 m depth has been initiated.

Seabed Mining

India registred as a Pioneer Investor in 1987 with a Polymetallic Nodule mining side in the Central Indian Ocean Basin. Long range R&D programme have been formulated for survey exploration for resource assessment. Environmental Impact Studies, development of technology for mining from the seabed, and technology for extractive metallurgy. Spin0off applications for exploration and exploitation of seabed minerals in shallow depths have been an important aspect that has emerged.

Financial Support

To support the aims and goals of IOC, as was done in 1997, this year also India is contributing US$25,ooo towards the IOC Trust Fund to promote activities in the Indian Ocean Region.

E. MEXICO

The Mexican Sub-committee for IOC is currently developing a work plan aimed at fostering cooperation among marine science institutes in order to launch a national programme to coordinate Mexico's oceanographic activities and increase its participation in IOC projects.

OCEAN MAPPING

In November 1998, the National Institute for Statistics, Geography and Information Technology **(INEGI)** hosted the Seventh Meeting of the Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico **(IBCCA)** in Aguascalientes, Mexico. We made a significant contribution to the development of **IBCCA** through INEGI, which acted as Chairperson of the Editorial Board.

In the light of widespread technological development and imbalances in resources of Member States, we would like IOC to increase its support to help conclude the project.

IOC SUBCOMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS **(IOCARIBE)**

We actively took part in the sixth session of IOCARIBE in San José, Costa Rica from 26 to 29 April 1999.

At that meeting we outlined the new vision Mexico has been developing in the national organization for IOC.

We supported the new Plan of Action and Medium-Term Strategy and we reiterated our commitment to carry it out through our role as Vice-Chairperson, to which post we were re-elected at the meeting. We ratified support for the request that the Assembly approve these documents and issue guidelines and recommendations for their execution. We also emphasized the need to regularize support for the Sub-commission Secretariat.

INTERNATIONAL YEAR OF THE OCEAN

Mexico successfully executed a comprehensive programme in **1998**, the **International Year of the Ocean**, which was outlined at the Thirty-first Session of the Executive Council. After observing the impact on society of an awareness-building campaign on the need to protect and study the ocean, Mexico extended the International Year of the Ocean to include the following events.

A travelling exhibition was held from July to September 1998 called **Conoces del Mar?** (Do you know about the sea?). The exhibition was also shown in the port of Veracruz and moved to the port of Mazatlán, where it was on display from August to October 1999.

To sensitize the population about prolonged drought, an exhibition was organized to promote rational use of water during INTERTECMAR 99, a seminar attended by 1,371 students of marine science and technology. Students took part in a wide range of sports and academic competitions. The exhibition was also shown in Veracruz and will soon tour other ports.

Mexico moved its entire pavilion from Expo 98 in Lisbon to Mexico City. It will remain on display at the Museo del Niño, then tour the country. This event was coordinated by the Ministry of the Environment, Natural Resources and Fishing (SEMARNAP).

Under the coordination of Mexico's Marine Ministry, the *Contingency Plan for the Prevention of Spills of Hydrocarbons and other Toxic Substances in the Sea* has been updated. Surveillance and warning systems have been upgraded and contingency exercises organized.

The marine science and technology division of the Ministry of Public Education **(DECyTEM; SEP)** is developing a programme to focus curricula on **sustainable development** at all educational levels.

Having examined document **IOC-XX/2 Annex 9**, which outlines new activities to follow up the **International Year of the Ocean**, we wish to record our willingness to continue participating by means of various awareness-building and educational activities such as those described, in addition to others to be organized in the near future.

GLOBAL OCEAN OBSERVING SYSTEM (GOOS)

A number of projects are being planned that could provide information for the Health of the Ocean Panel and the Coastal Panel. Our policy is to continue to support the working groups engaged on projects related to GEOHAB and ICSU in Mexico.

F. PERU

The Republic of Peru, through the Directorate for Hydrography and Navigation of its Navy, is engaged in a series of activities aimed at better scientific understanding of acquatic concerns, with special emphasis on the ocean.

Nature's manifestations over time, with oceanographic, meteorological and/or biological parameters showing alterations and variability in the complex ocean/atmosphere interaction and their direct impact on the marine environment and also on hydrobiological resources, have forced Peru to deploy considerable efforts to integrate referential and *in situ* information with conditions prevailing in the ocean and close oceanic relations with coastal zones. Several of these multidisciplinary activities have been carried out within the framework of the Global Ocean Observing System (GOOS), such as:

- Organization of four oceanographic cruises *per* year to collect CTD, XBT data, meteorological parameters, depth samples, and other relevant information, with the aim of determining the thermic structure of water up to the 200 nautical mile line. These cruises are undertaken systematically, during seasonal periods characterized by sensitive physical, chemical, biological and meteorological variations.

- Permanent operation of nine marine data stations which continually register sea level changes, over a period now exceeding 57 years. These are located at the following ports: Talara, Paita, Isla Lobos de Afuera, Salaverry, Chimbote, Callao, Pisco, San Juan and Matarani.

- Permanent operation of fourteen coastal meteorological stations which continually register information on parameters suitable for their integration in climate variation studies. These are located at the following ports: El Salto, Zorritos, Paita, Isla Lobos de Afuera, Pimentel, Chicama, Salaverry, Chimbote, Callao, Pisco, San Juan, Matarani, Atico and Ilo.

- Establishment of coastal profiles apt to highlight dynamic processes of major impact on the coastal environment, as well as to identify zones sensitive to the impact of anthropogenic factors or natural causes. This task is carried out in compliance with accepted Integral Management of Coastal Zones criteria. Until now, coastal profiles have been prepared for:
  - Punta Capones-Paita
  - La Punta-Cerro Azul
  - Bahfa Miraflores (Costa Verde)

  A fourth one is under way for:
  - Bahfa lte-La Concordia

- These and related studies have made possible the definition of criteria for the setting up of information systems (SIG) on the characteristics of dynamic coastal systems comprising waves, marine currents, sedimentation, erosion and other aspects to be taken into account in the adequate management of coastal zones.

- Permanent participation in cruises for the evaluation of hydrobiological resources, to identify inter-relationships among the physico-chemical parameters of sea-water, and to observe the evolution of oceanic living resources.' This involves ten such cruises *per* year and, moreover, participation in collateral research cruises by foreign ships.

- Participation in marine pollution studies by providing technical support for the identification of marine circulation systems, maximum permissible parameters and peripheral aspects related to the monitoring of water quality.

Recently, on 6 and 7 May 1999, at the headquarters of the World Bank in Washington, DC, the Peruvian Government represented by institutions responsible for studying the El Niño phenomenon, presented to specialists from NOAA and other scientific bodies of the United States of America, a Project for the Strengthening of the Capacity for Ocean Observation. The project entails the acquisition of ten last-generation oceanic measuring and meteorological stations allowing real-time data transmission, and a high-resolution satellite image reception system (GVAR) which, together with improved communications, analysis and data distribution, while using the already available infrastructure, will reinforce the potential for observation, integration and also of numerical modelling, and substantially optimize the capability for predicting disasters such as those ensuing from El Niño and reducing their impact on the country's socio-economic activities.

Special interest is being shown in the efforts being made by the South-East Pacific Region (Colombia, Chile, Ecuador and Peru) to strengthen its past action with operational and research

programmes which will permit governments and the international scientific community to better understand nature's manifestations in that sensitive zone which have macro-scale climatic repercussions. Existing human resources for the accomplishment of this task must be further developed, so as to ensure the operational continuity of the existing and planned systems of observation and data gathering.

It should finally be mentioned that during rounds of talks held by the High Commands of the Armed Forces of Peru, Ecuador and Chile, the Peruvian Navy has proposed the organization of a joint oceanographic cruise to take place in the last quarter of each year, starting in 1999, to monitor ocean-meteorologic conditions of the region. Use would be made of the installed capacity of the Navies concerned as has been the case, each month of May since 1998, for the regional effort made by the scientific components of the regional study of the El Niño Phenomenon (ERFEN), within the framework of the "Comisión Permanente del Pacífico Sur" (CPPS). The proposed cruises are conceived as a joint contribution to the wider endeavours of the international scientific community.

The Government of Peru, through the Directorate for Hydrography and Navigation of its Navy, invites the Delegations of other IOC Member States to study the possibility of coordinating the present installed capacity of their Navies, as of the current year, in response to the new proposed aims. By doing so, they would optimize their combined potential for observation, monitoring, integration and research of the oceans and coastal zones, to the benefit of the socio-economic development of all peoples.

To further elaborate the above proposal and promote the participation of national Navies, the Peruvian Delegation is considering a Draft Resolution which would provide the required conceptual framework.

G. SOUTH AFRICA

Preamble

This document serves to describe, in brief terms, the range of IOC-related oceanographic and atmospheric operational activities currently in existence in South Africa. In addition, it highlights co-ordination efforts, nationally, regionally and internationally, gives examples of capacity-building initiatives in marine science in South Africa, and describes current IOC- related research programmes in the southern African region.

1. GOOS MODULES

In South Africa, the following activities are GOOS-related :

Activity	Responsible Agency
1. **Marine services :**	
Sea level network	S.A. Navy Hydrographic Office S.A. Weather Bureau (SAWB)
Maritime weather forecasts	

2. **Living Marine Resources :**	
Biodiversity, Stock biomass, Population dynamics	Marine and Coastal Management
3**. Coastal Management :**	
Integrated Marine and Coastal Management	Marine and Coastal Management
4. **Health of the Ocean :**	
HABS research, monitoring and surveillance	Marine and Coastal Management
Oil spill contingency plans Effluent disposal	Dept. Environment: Poll. Control Local authorities
5. **Weather/climate:**	
Seasonal railfall forecasts	SAWB

In addition, South Africa has as its NODC the CSIR-managed SADCO oceanographic database while also contributing to the East African ODINEA network *via* the links between IOC and the Chief Directorate : Marine and Coastal Management (MCM) [formerly Sea Fisheries].

2. GOOS INITIAL OBSERVING SYSTEM (IOS)

South African contributions to IOS include:

GLOSS	(SAN Hydrographic Office, SAWB and UCT)
Data Buoy Co-operation Panel	(SAWB and Marine and Coastal Management)
VOS	(Voluntary oceanographic/met observations from vessels) (SAWB)

Note : South Africa also contributes to **African** regional initiatives *via* GOOS-Africa; the African GLOSS network; ODINEA and SADCO; the BENEFIT and BCLME programmes (South Africa/Namibia/Angola co-operative regional research). Although there is currently no National Committee for GOOS in South Africa, co-ordination of marine science-related issues takes place *via* SANCOR (S.A. network for Coastal and Oceanic Research).

3. CAPACITY BUILDING

Within South Africa, capacity-building is largely carried out by universities and technikons which provide specialist advanced courses in marine science and technology. Much in-house training is also provided by operational agencies such as Marine and Coastal Management, the Oceanographic Research Institute in Durban, etc. These operational agencies maintain close links with the universities specialising in marine science. Annual enrolment of senior and postgraduate students is currently over 100, and due to increase sharply under the sposorship of the US/SA Bi-national Commission.

As a relatively technically-advanced country in the continent, South Africa offers capacity-building facilities for the benefit of the region, vested primarily at tertiary training institutions such as UCT, UWC and at other universities and NGOs.

4. CURRENT ACTIVITIES

South Africa is actively involved in HABs research, especially on its west coast where toxic algal blooms occur virtually every year, as a result of natural processes. Dr G. Pitchen of Marine and Coastal Management (MCM) represents South Africa on the GEOHAB scientific steering committee. The South African delegation to the IOC is currently headed by Dr D.E. Pollock, Deputy Director of Environmental Research at MCM.

The BENEFIT research programme is a co-operative research programme aimed primarily at strengthening marine science capacity development in three southern African countries adjoining the west coast's Benguela upwelling system, i.e. Angola, Namibia and South Africa. At the time of writing this report, a training course is taking place on board MCM's flagship research vessel, *R.S. Africana*, with participation by Marine scientists and technicians from the three countries concerned.

In addition to BENEFIT, a GEF-funded Benguela Current Large Marine Ecosystem (SCLME) programme is currently in its development phase. Again spanning the countries of South Africa, Namibia and southern Angola, this programme will focus largely on environmental impacts on the ecosystem imposed by both anthropogenic activities such as seabed mining and fishing, as well as by natural environmental variability.

South Africa is also becoming increasingly involved in East African marine science activities, through its involvement with IOCINCWIO activities such as ODINEA and ODINAFRICA. Having a long-established national oceanographic database (called SADCO), South Africa is in a good position to provide oceanographic data as well as data management advice to its neighbouring states both on the east and west coasts of Africa. Some of these SADCO data go back to 1854, and the area of coverage currently extends to 10° north of the equator.

H. TUNISIA

In accordance with IOC resolutions and recommendations Tunisia has developed its marine research programmes, which include the following.

International Year of the Ocean

Tunisia has engaged in intense scientific and cultural activity to build up public knowledge and make people more aware of the importance of the sea for humankind and the need to protect the marine environment.

In addition to participating in Expo 98 in Lisbon, Tunisia renovated its maritime museum, which dates back to 1924, and opened a new aquarium to the public. A travelling exhibition about the sea toured inland Tunisia with assistance from UNESCO. An old train was specially restored to transport the exhibition. A cultural CD-ROM on the sea was also launched. Close cooperation was fostered between ministries, NGOs, educational institutions, research centres and local councils to organize festivals, conferences and public seminars on marine-related topics.

Furthermore, a number of articles on the marine environment were published in the general press and special programmes on the sea were put out regularly on radio and television.

These myriad activities culminated at the end of the year in a scuba-diving festival and a seminar on the role of Tunisian women in sustainable marine development.

Global Ocean Observing System (GOOS)

In response to IOC's call to collaborate in the GOOS and GLOSS programmes designed to bolster ocean observing systems and study sea-level changes, Tunisia is taking part in European observing, data-processing and modelling programmes to help understand the flows and dynamics of sea currents in the Tunisian-Sicilian channel. In addition, a programme funded by the Tunisian Government was launched this year to set up three stations along the Tunisian coast to study, collect and process data on sea-level changes. This national funding is intended to develop oceanographic research infrastructure to enable researchers to cooperate in the GOOS and GLOSS networks.

GEOHAB programme to study toxic algae

Within the scope of IOC's GEOHAB programme and in cooperation with the Ministry of Agriculture, Tunisia has set up a national network to monitor toxic phytoplankton, which has been operational since 1995. Tunisia has had the benefit of expert training in this field.

GIPME programme

Thanks to the technology transfers, material support and capacity-building from which Tunisia has benefited and to which IOC contributed together with UNEP and IAEA, we have obtained very good results in this field and possess an excellent interdepartmental network in Tunisia to monitor pollution along the coast.

OSLR programme to study living marine resources

Under this programme, Tunisia has developed a national programme to appraise benthic fishery resources (25 species) and pelagic resources (six species of small pelagic fish, tuna and swordfish) along the Tunisian coast. This research enabled Tunisia to introduce a highly effective sustainable management system for its marine resources in 1998. Furthermore, fishing years are now stringently monitored thanks to the results of research conducted before, during and after each fishing year.

This new policy strategically focuses on research to guarantee comprehensive, sustainable economic development. Tunisia has been seeking such a policy change since 1987.

In line with the global campaign to protect living marine resources and pursuant to IOC recommendations, Tunisia is working with the Principality of Monaco to develop a *coralliculture* (coral regeneration) system. We regularly monitor the nesting of sea turtles and carry out inventory, identification and protection programmes for marine mammals, particularly dolphins and whales. A collection of reference specimens is currently being rehabilitated according to the standards originally set by IOC in the 1980s.

IODE programme

IODE is a very special IOC programme as it is based on a worldwide data collection and processing network. Tunisia is taking part in this programme and recently set up a general marine data system, which needs the support of IOC to develop its activities and collect and process large sets of marine data dating back to the beginning of the century.

Other programmes

In addition to these programmes for which we have now obtained significant results, Tunisia has recently launched other projects in accordance with IOC guidelines. These programmes focus on climatic change, undersea mapping, etc.

ANNEX VII

A. LIST OF MEMBER STATES OF THE IOC EXECUTIVE COUNCIL

ARGENTINA
AUSTRALIA
BELGIUM
BRAZIL
CANADA
CHILE
CHINA
COLOMBIA
COSTA RICA
CUBA
EGYPT
FRANCE
GERMANY
GREECE
INDIA
INDONESIA
ITALY
JAMAICA
JAPAN
KENYA
MEXICO
MOROCCO
NIGERIA
PERU
PHILIPPINES
PORTUGAL
REPUBLIC OF KOREA
RUSSIAN FEDERATION
SOUTH AFRICA
SPAIN
SWEDEN
THAILAND
TUNISIA
UKRAINE
UNITED KINGDOM OF GREAT BRITAIN and NORTHERN IRELAND
UNITED STATES OF AMERICA

B. MEMBER STATES OF THE COMMISSION (126)
(as of 9 July 1999)[1]

AFGHANISTAN	(11 March	1991)
ALBANIA	(26 January	1993)
ALGERIA	(Jul. 1964/Nov.	1965)
ANGOLA	(26 October	1982)
* ARGENTINA	(Before November	1961)
* AUSTRALIA	(Before November	1961)
AUSTRIA	(Oct. 1962/Jun.	1964)
AZERBAIJAN	(27 January	1998)
BAHAMAS	(29 January	1979)
BANGLADESH	(29 October	1982)
BARBADOS	(18 December	1985)
* BELGIUM	(Before November	1961)
BELIZE	(22 September	1995)
BENIN	(23 October	1986)
* BRAZIL	(Before November	1961)
BULGARIA	(Oct. 1967/Dec.	1969)
CAMEROON	(Nov. 1971/Nov.	1973)
* CANADA	(Before November	1961)
CAPE VERDE	(20 August	1984)
* CHILE	(Before November	1961)
* CHINA	(Before November	1961)
* COLOMBIA	(Oct. 1967/Dec.	1969)
CONGO	(Nov. 1961/Sep.	1962)
* COSTA RICA	(28 February	1975)
COTE D'IVOIRE	(Before November	1961)
CROATIA	(24 December	1992)
* CUBA	(Before November	1961)
CYPRUS	(05 December	1977)
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	(31 October	1978)
DENMARK	(Before November	1961)
DOMINICAN REPUBLIC	(Before November	1961)
ECUADOR	(Before November	1961)
* EGYPT	(Oct. 1969/Nov.	1971)
EL SALVADOR	(16 February	1993)
ERITREA	(12 November	1993)
ESTONIA	(10 March	1992)
ETHIOPIA	(05 March	1976)
FIJI	(09 July	1974)
FINLAND	(Before November	1961)
* FRANCE	(Before November	1961)
GABON	(26 October	1977)
GAMBIA	(30 August1985)	
GEORGIA	(9 July	1993)
* GERMANY	(Before November	1961)
GHANA	(Before November	1961)
* GREECE	(Oct. 1962/Jun.	1964)
GUATEMALA	(Dec. 1965/Oct.	1967)
GUINEA	(01 May	1982)
GUINEA-BISSAU	(26 January	1984)
GUYANA	(20 July	1977)
HAITI	(23 March	1976)
ICELAND	(Oct. 1962/Jun.	1964)
* INDIA	(Before November	1961)
* INDONESIA	(Oct. 1962/Jun.	1964)
IRAN, ISLAMIC REPUBLIC OF	(03 June	1975)
IRAQ	(Oct. 1969/Nov.	1971)
IRELAND	(07 November	1978)
ISRAEL	(Before November	1961)
* ITALY	(Before November	1961)
* JAMAICA	(Oct. 1967/Dec.	1969)
* JAPAN	(Before November	1961)
JORDAN	(06 April	1975)
* KENYA	(Nov. 1971/Nov.	1973)
KUWAIT	(13 November	1974)
LEBANON	(Oct. 1962/Jun.	1964)
LIBYAN ARAB JAMAHIRIYA	(11 March	1974)
MADAGASCAR	(Dec. 1965/Oct.	1967)
MALAYSIA	(Jul. 1964/Nov.	1965)
MALDIVES	(20 May	1987)
MALTA	(Oct. 1969/Nov.	1971)
MAURITANIA	(Before November	1961)
MAURITIUS	(Oct. 1969/Nov.	1971)
* MEXICO	(Before November	1961)
MONACO	(Before November	1961)
* MOROCCO	(Before November	1961)
MOZAMBIQUE	(08 April	1981)
MYANMAR	(07 June	1988)
NETHERLANDS	(Before November	1961)
NEW ZEALAND	(Nov. 1961/Sep.	1962)
NICARAGUA	(17 November	1977)
* NIGERIA	(Nov. 1971/Nov.	1973)
NORWAY	(Before November	1961)
OMAN	(16 November	1982)
PAKISTAN	(Before November	1961)
PANAMA	(Oct. 1967/Sep.	1969)
* PERU	(Dec. 1965/Oct.	1967)
* PHILIPPINES	(Oct. 62/Jun.	1964)
POLAND	(Before November	1961)
* PORTUGAL	(Oct. 1969/Nov.	1971)
QATAR	(20 July	1976)
* REPUBLIC OF KOREA	(Before November	1961)
ROMANIA	(Before November	1961)
* RUSSIAN FEDERATION	(Before Nov.	1961)
SAINT LUCIA	(14 September	1992)
SAMOA	(10 April	1978)
SAUDI ARABIA	(14 June	1978)
SENEGAL	(Oct. 1967/Sep.	1969)
SEYCHELLES	(27 February	1979)
SIERRA LEONE	(19 April	1974)
SINGAPORE	(Dec. 1965/Oct.	1967)
SLOVENIA	(16 June	1994)
SOLOMON ISLANDS	(11 May	1982)
SOMALIA	(10 July	1974)
* SOUTH AFRICA	(Oct. 1967/Sep.	1969)
* SPAIN	(Before Nov.	1961)
SRI LANKA	(Jun. 76/Jan.	1977)
SUDAN	(26 August	1974)
SURINAM	(21 January	1977)
* SWEDEN	(Jul. 1964/Nov.	1965)
SWITZERLAND	(Before Nov.	1961)
SYRIAN ARAB REPUBLIC	(Oct.1969/Nov.	1971)
* THAILAND	(Before Nov.	1961)
TOGO	(22 October	1975)
TONGA	(03 January	1974)
TRINIDAD & TOBAGO	(Oct. 1967/Sep.	1969)
* TUNISIA	(Before Nov.	1961)
TURKEY	(Nov. 1961/Sep.	1962)
* UKRAINE	(Nov. 1961/Sep.	1962)
UNITED ARAB EMIRATES	(02 June	1976)
* UNITED KINGDOM OF GREAT BRITAIN & NORTHERN IRELAND	(Before Nov.	1961)
UNITED REPUBLIC OF TANZANIA	(Oct. 1967/Sep.	1969)
* UNITED STATES OF AMERICA	(Before Nov.	1961)
URUGUAY	(Before Nov.	1961)
VENEZUELA	(Oct. 1962/Jun.	1964)
VIET NAM	(Before Nov.	1961)
YEMEN	(22 May	1960)

MEMBERS OF THE EXECUTIVE COUNCIL ARE INDICATED WITH AN ASTERISK

[1] On September 21, 1999, Dominica became the 127th Member States of the Commission.

ANNEX VIII

LIST OF DOCUMENTS

Document Code	Title	Agenda Items	Languages available
WORKING DOCUMENTS[1]			
IOC-XX/1 prov. rev	Provisional Agenda	1.3	E F S R
IOC-XX/1 Add. prov. rev.	Provisional Timetable	1.6	E only
IOC-XX/2	Action Paper	--	E F S R
IOC-XX/2 Corr.	Action Paper-Corrigendum	--	E F S R
IOC-XX/2 Add. & Corr.	Action Paper – Addendum and Corrigendum	--	E F S R
IOC-XX/2 Annex 1	Report on Budget Execution (1998-99)	2.2	E F S R
IOC-XX/2 Annex 2	Comments on DOSS-2 Report received from Member States	2.4	E F S R
IOC-XX/2 Annex 3	Recommendations of GIPME Officers for the Restructuring of the GIPME Programme	3.3	E F S R
IOC-XX/2 Annex 4	IODE After 2000: A Glimpse into the Future	4.1	E F S R
IOC-XX/2 Annex 5 **(withdrawn)**	Plan of Action for the North Indian Ocean Storm Surges Project Proposal	4.3	E F S R
IOC-XX/2 Annex 6	Draft Interim Report of the Working Group on GOOS Funding	5.1	E only
IOC-XX/2 Annex 7	Proposal for the Establishment of a Regional IOCINCWIO Secretariat	6.1.4	E F S R
IOC-XX/2 Annex 8	TEMA – Programme 1999-2000	7.	E F S R
IOC-XX/2 Annex 9	Plan of the IYO Follow-up Actions	10.	E F S R
IOC-XX/2 Annex 10	Proposal on the Draft Programme and Budget 2000 - 2001 (30 C/5)	12.	E F S R
IOC-XX/3 prov.	Draft Summary Report *(to be issued during the Session)*	--	E F S R
IOC-XX/4	Provisional List of Documents*)*	1.6	E F S R
IOC-XX/5 prov.	Provisional List of Participants	--	E/F/S
REPORTS OF IOC AND COOPERATIVE BODIES REQUIRING ACTION			
IOC/EB-IBCWIO-IV/3 *	IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean, 4th Session, Cape Town, October 1997	4.2	E only
IOC/EB-IBCM-VII/3 *	IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its	4.2	E only

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

Document Code	Title	Agenda Items	Languages available
	Geological/Geophysical Series, 7th Session, Cavtat, June 1998		
IOC-WMO-UNEP/ I-GOOS-IV/3s	Report of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, 4th Session, Paris, June 1999*(Executive Summary)*	5.1	E only
IOC-WMO-UNEP-ICSU/ C-GOOS-II/3	Report of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), 2nd Session, Curitiba, October-November 1998	5.1	E only
IOC/WESTPAC-IV/3s	Report of the IOC Regional Sub-Commission for the Western Pacific, 4th Session, Seoul, March 1999 *(Executive Summary)*	6.1.1	E only
IOC/SC-IOCARIBE-VI/3s	Report of the IOC Sub-Commission for the Caribbean and Adjacent Regions, 6th Session, April 1999 *(Executive Summary)*	6.1.2	E only
INFORMATION AND OTHER REFERENCE DOCUMENTS			
SC/MD/216	Summary Report of the Nineteenth Session of the IOC Assembly	--	E F S R
IOC/EC-XXXI/3	Summary Report of the Thirty-first Session of the IOC Executive Council	--	E F S R
IOC/INF-1120	Guidelines for Participants	1.6	E only
IOC Annual Report No.5	IOC Annual Report, 1998	2.1	E only
IOC Annual Report No.5 Addendum	Implementation of IOC Governing Bodies Resolutions	2.1	E only
IOC-XIX/2 Annex 4 *	Proposal on the Draft Programme and Budget 1998-1999	2.2	E F
IOC/EC-XXXI/16 *	IOC Programme and Budget Adjustements to Current Biennal Budget 1998-1999	2.2	E F
IOC/EC-XXXI/6 *	Progress Report of DOSS-2	2.4	E F S R
IOC/INF-1121	OSLNR Group of Experts Meeting, Paris, 1997	3.2	E only
IOC/IASC/IHO/ EB-IBCAO-I/3 **	IOC/IASC/IHO Editorial Board for the International Bathymetric Chart of the Arctic Ocean, Copenhagen, October, 1998	4.2.	E only
IOC/CGOM-VI/3 *	IOC Consultative Group on Ocean Mapping, 6th Session, Monaco, April 1997	4.2.	E only
IOC/INF-1122	Report of the IOC Consultative Group on Ocean Mapping to the Twentieth Session of the IOC Assembly	4.2.	E only
The GOOS 1998 **	A Prospectus for GOOS*(Executive Summary in E F S R included)*	5.1	E only
IOC/INF-1123	Relevant Excerpts of the Fourth Conference of the Parties (COP) to the Framework Convention on Climate Change (FCCC)	5.1 & 5.2	E only

Document Code	Title	Agenda Items	Languages available
IOC-XX/Inf. 1	GCOS Memorandum of Understanding	5.2	E only
Technical Series 50 *	GLOSS Implementation Plan - 1997	5.3.2	E only
IOC/EC-XXXI/10	Joint Commission for Oceanography and Marine Meteorology	5.4	E F S R
IOC/INF-1126	Draft Project Proposal: Intra-Americas Sea Tsunami Warning System Education, Warning, Management and Research	6.1.2	E only
Workshop Report 155	Workshop Report on the Science of the Mediterranean Sea and its Applications, Paris, July 1997	6.1.7	E only
IOC-XX/Inf. 2	MedGOOS Memorandum of Understanding	6.1.7	E only
PACSICOM, Maputo, 1998	Summary Record of the Main Conclusions and Specific Recommendations	6.2	E F
IOC/INF-1112 *	Background Elements, Concepts, Definitions, Principles and Pilot Implentation of Recent Capacity-Building Action within the TEMA Programme	7.	E only
Workshop Report 151 *	Taller Pluridisciplinario TEMA sobre Redes del Gran Caribe en Gestion Integrada de Areas Costeras	7.	S only
IOC/INF-1035 *	Summary Report of the First Session of the Opennended Intersessional Working Group on IOC=s Possible Role in Relation of the United Nations Convention on the Law of the Sea, Paris, May 1996	9.3	E only
IOC/INF-1054 *	Draft IOC Principles of Transfer of Marine Technology	9.3	E only
IOC/INF-1055 *	Draft IOC Guidelines for Application of Article 247 of UNCLOS	9.3	E only
IOC/INF-1114 *	Summary Report of an Informal Advisory Consultation on Implementation of IOC Assembly Resolution XIX-19	9.3	E F
IOC/EC-XXXI/13	Experiences from the 1998 IYO	10.	E F S R
IOC/INF-620 rev. 3 *	Technical Arrangements for the Elections	13.	E F S R
IOC/INF-785 *	IOC Manual	13.	E F S R
COI-OMM-CPPS/ El Niño-IX/3 *	Novena Reunión del Grupo Mixto de Trabajo COI-OMM-CPPS sobre las Investigaciones Relativas a AEl Niño@, Guayaquil, noviembre, 1998	--	S only

* 1 copy per delegation
** on request

ANNEX IX

LIST OF PARTICIPANTS

I. OFFICERS OF THE COMMISSION/BUREAU DE LA COI/MESA DE LA COI

Chairman

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First Vice-Chairman

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ANNEX X

LIST OF ACRONYMS

AAIW	Antarctic Intermediate Water
ABE-LOS	Advisory Body of Experts on the Law of the Sea
ACC	Administrative Committee on Co-ordination
ACC-SOCA	ACC Sub-Committee on Oceans and Coastal Areas
ACOPS	Advisory Committee on Protection of the Seas
AIMS	Analysis, Interpretation, Modelling and Synthesis
AOD'98	African Ocean Days
AOSB	Arctic Ocean Science Board
APARD	Arctic Paleo River Discharge
Argo	Array for Real-time Geostrophic Oceanography (CLIVAR-GODAE)
ASFA	Aquatic Sciences and Fisheries Abstracts
ASOS	Automated Seismological Observation System
BC	Brazil Current
BSEC	Black Sea Economic Co-operation
BSH	Bundesamt für Seeschiffahrt und Hydrographie
BSRC	Black Sea Regional Committee
CalCOFI	California Co-operative Oceanic Fisheries Investigations
CARICOM	Caribbean Community
CARICOMP	Caribbean Coastal Marine Productivity Programme
CBD	Convention on Biological Diversity (UN, 1992)
CBS	Commission for Basic Systems
CC	Commission for Climatology
CCCC	Climate Change and Carrying Capacity
CD-ROM	Compact Disc - Read Only Memory
CEOS	Committee on Earth Observation Satellites
CGOM	IOC Consultative Group on Ocean Mapping
C-GOOS	Coastal Module Panel of GOOS
CLIVAR	Climate Variability and Predictability (WCRP)
CMM	Commission for Marine Meteorology (WMO)
CMSLT	Commission on Mean Sea Level and Tides
CNES	Centre national d'études spatiales (France)
COMEMIR	Continental Margin Environments and Mineral Resources
COOE	Co-operative Ocean Observing Experiment [Australia]
COP	Convention on Climate Change
CPPS	Permanent Commission for the South Pacific
CSI	Unit of Coastal Regions and Small Islands (UNESCO)
CSR	Cruise Summary Reports
CZAR	Coastal Zone as Resources in its own Right
CTD	Conductivity-Temperature-Depth (profiler)
DANIDA	Danish Agency for International Development
DBCP	Data Buoy Co-operation Panel
DBE	Deep Basin Experiment
DFID	Department for International Development (UK)
DNA	Designated National Agency
DNMI	Marine Forecasting Centre of Norwegian Meteorological Institute (Norway)

DOALOS	Division for Ocean Affairs and the Law of the Sea (UN)
DOD	Deutsches Ozeanographisches Datenzentrum
DOSS-2	*Ad hoc* Study Group on IOC Developments, Operations, Structure and Statutes
ECMWF	European Centre for Medium Range Weather Forecasting
EEZ	Exclusive Economic Zone
EGOS	European Group on Ocean Stations
E-IPB	Electronic IGOSS Products Bulletin
ENSO	*El-Niño* - Southern Oscillation
ESODAE	European Shelf-Seas/Ocean Data Assimilation and Forecasting Experiment
EU	European Union
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
Euro-GOOS	European GOOS
EURONODIM	European Network for Oceanographic Data & Information Management
FANSA	Groupo de Trabajo sobre Floraciones Algales Nocivas en Sudamérica
FAO	Food and Agriculture Organization (UN)
FCCC	Framework Convention on the Climate Change (Kyoto, 1997)
FURG	Fundação Universidade do Rio Grande
GARP	Global Atmospheric Research Programme (WMO-ICSU)
GCOS	Global Climate Observing System
GCRMN	Global Coral Reef Monitoring Network
GDP	Global Drifter Programme
GEBCO	General Bathymetric Chart of the Oceans (IOC-IHO)
GEF	The Global Environmental Facility (World Bank-UNEP-UNDP)
GEOHAB	Global Ecology and Oceanography of Harmful Algal Blooms
GESAG	GIPME Expert Scientific Advisory Group
GIPME	Global Investigation of Pollution in the Marine Environment (IOC-UNEP)
GIS	Geographic Information Systems
GLOBEC	Global Ocean Ecosystem Dynamics
GLODIR	Global Directory of Marine (and Freshwater) Professionals
GLOSS	Global Sea-Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GOOS-IOS	GOOS Initial Observing System
GOS	Global Observing System
GOSSP	Global Observing Systems Space Panel
GPA	Global Plan of Action
GPO	GOOS Project Office
GSC	GOOS Steering Committee
GTOS	Global Terrestrial Observing System
GTS	Global Communication System
GTSPP	Global Temperature and Salinity Profile Programme
HAB	Harmful Algal Blooms
HELCOM	Baltic Marine Environment Protection Commission (Helsinki Commission)
HOTO	Health of the Ocean
IABP	International Arctic Buoy Programme
IACSD	Inter-Agency Committee on Sustainable Development

IAEA	International Atomic Energy Agency
IAPSO	International Association for the Physical Sciences of the Ocean (IUGG)
IAS	Intra-Americas Sea
IASC	International Arctic Sciences Committee
IBCAO	International Bathymetric Chart of the Arctic Ocean (IOC-IASC-IHO)
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IOC)
IBCM	International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series (IOC)
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
IBCWP	International Bathymetric Chart of the Western Pacific (IOC)
IBPIO	International Buoy Programme for the Indian Ocean
ICAM	Integrated Coastal Area Management
ICES	International Council for the Exploration of the Sea
ICG-ITSU	International Co-ordination Group for the Tsunami Warning System in the Pacific
ICIWP	International Conference for the IODE-WESTPAC
ICSEM	International Commission for the Scientific Exploration of the Mediterranean Sea
ICSU	International Council for Science [previously: International Council of Scientific Unions]
IDNDR	International Decade for Natural Disaster Reduction
IEAPM	Instituto de Estudos Almirante Paulo Moreira (Brazil)
IFREMER	Institut français de recherche pour l'exploitation de la mer
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGFA	International Group of Funding Agencies for global change research
I-GOOS	Intergovernmental Committee for GOOS
IGOS	Integrated Global Ocean Services Strategy
IGOSS	Integrated Global Ocean Services System
IHO	International Hydrographic Organization
IHP	International Hydrological Programme (UNESCO)
IMF	International Monetary Fund
IMO	International Maritime Organization
IMR	Institute of Marine Research
INPE	National Institute of Space Research (Brazil)
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCARIBE-GOOS	IOCARIBE Regional GOOS
IOCCG	International Ocean Colour Co-ordinating Group
IOCEA	Regional Committee for the Central Eastern Atlantic
IOCINCWIO	Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean
IOCINDIO	Regional Committee for the Central Indian Ocean
IOCSOC	Regional Committee for the Southern Ocean
IODE	Committee for International Oceanographic Data and Information Exchange
IOI	International Ocean Institute
IO-USP	Oceanographic Institute of the University of São Paulo
IPAB	International Programme for Antarctic Buoys
IPHAB	Intergovernmental Panel on Harmful Algal Blooms

IPOs	International Project Offices
IRD	Institut de Recherche pour le Développement (France) (formerly ORSTOM)
ISABP	International South Atlantic Buoy Programme
ITSU	International Co-ordination Group for the Tsunami Warning System in the Pacific (IOC)
ITU	International Telecommunication Union
IUGG	International Union of Geodesy and Geophysics
IYO	International Year of the Ocean
JCOMM	Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology
J-DIMP	Joint Data and Information Management Panel
JGOFS	Joint Global Ocean Flux Study
JODC	Japan Oceanographic Data Centre
KMFRI	Kenya Marine and Fisheries Research Institute
LBA	Land-Based Activities
LMR	Living Marine Resources
LOICZ	Land-Ocean Interaction in the Coastal Zone (IGBP)
MAB	Man and the Biosphere Programme (UNESCO)
MAP	Mediterranean Action Plan (UNEP)
MAST	Marine Science and Technology
MedGLOSS	Mediterranean Regional GOOS
MEDI	Marine Environmental Data Information Referral Service
MEDS	Marine Environmental Data Service
MEL	Marine Environmental Laboratory (IAEA)
MESL	Marine Environment Studies laboratory(IAEA-MEL)
MIM	Marine Information Management
MOST	Management of Social Transformation (UNESCO)
MOU	Memorandum of Understanding
NATO	North Atlantic Treaty Organization
NCEP	National Centres for Environmental Prediction (USA)
NCMR	National Centre for Marine Research (Greece)
NEAR-GOOS	North-East Asian Regional GOOS
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration (USA)
NODC	National Oceanographic Data Centre (Germany)
NOWPAP	Northwest Pacific Action Plan (UNEP)
NPOESS	National Polar Orbiting Environmental Satellite (USA)
OAS	Organization of American States
OAU	Organization of African Unity
ODINAFRICA	Ocean Data and Information Network for Africa
ODINEA	Ocean Data and Information Network for Eastern Africa
OOPC	Ocean Observation Panel for Climate
OOS	Operational Observing Systems
OOSDP	Ocean Observing System Development Panel (replaced by OOPC)
OSLR	Ocean Science in Relation to Living Resources (IOC)
OSNLR	Ocean Science in Relation to Non-Living Resources (IOC)
OSPAR	Oslo-Paris Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPARCOM)
PacificGOOS	Pacific Regional GOOS

PACSICOM	Pan-African Conference on Sustainable Integrated Coastal Management (Maputo, Mozambique, 18-25 July 1998)
PICES	North Pacific Marine Science Organization
PIRATA	Pacific, and the Pilot Research Array in the Tropical Atlantic
POEM	Physical Oceanography of the Eastern Mediterranean
POGO	Partnership for Observing the Global Oceans
PRIMO	Programme de recherche international en Méditerranée occidentale
RECOSCIX	Regional Co-operation in Scientific Information Exchange
RNODC	Responsible Oceanographic Data Centre (IODE)
ROSCOP	Report of Observations/Samples Collected by Oceanographic Programmes (IOC)
SADCO	South African Data Centre for Oceanography
SAHFOS	Sir Alister Hardy Foundation for Ocean Science
SCOPE	Scientific Committee on Problems of the Environment (ICSU)
SCOR	Scientific Committee on Oceanic Research (ICSU)
SEA-GOOS	South-East Asian GOOS
SEAPOL	South-East Asia Programme on Ocean Law, Policy and Management
SEASTART	South East Asia for START
SGD	Sub-marine Groundwater Discharge
Sida/SAREC	Swedish International Development Cooperation Agency -Swedish Agency for Research Cooperation with Developing Countries
SIDS	Small Island Developing States
SOA	State Oceanic Administration (China)
SOLAS	International Convention for the Safety of Life at Sea
SOOP	Ship-of-Opportunity Programme
SSC	Scientific Steering Committee
SST	Sea Surface Temperature
STAP	Scientific and Technical Advisory Panel (I-GOOS)
START	Global Change System for Analysis, Research and Training
STRC	Scientific and Technical Research Commission
SVPB	Surface Velocity Programme Barometer
TAO	Tropical Atmosphere Ocean
TAO-IP	Tropical Atmosphere Ocean-Implementation Panel
TEMA	Training, Education and Mutual Assistance
TOGA	Tropical Ocean and Global Atmosphere (WCRP)
TTR	Training-through-Research
UATI	International Union of Technical Association and Organizations
UKMO	United Kingdom Meteorological Office
UN CSD	Commission on Sustainable Development (UN)
UN	United Nations
UNCED	United Nations Conference on Environment and Development (Rio de Janeiro, 1992)
UNCLOS	UN Convention on the Law of the Sea
UN-DESA	Department of Economic and Social Affairs (UN)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNITWIN	University Twinning (UNESCO)
UNSIA	United Nations Special Initiatives for Africa
UOP	Upper Ocean Panel (CLIVAR)

URL	Uniform Resource Locator (Internet)
UTIS	Unité de Traitement d'Image Satellitaire (Senegal)
VOS	Voluntary Observing Ship
WCRP	World Climate Research Programme
WDC	World Data Centre
WESTPAC	Regional Sub-Commission for the Western Pacific
WGISS	Working Group on Information Systems and Services
WHO	World Health Organization (UN)
WIO	Western Indian Ocean
WMO	World Meteorological Organization (UN)
WOCE	World Ocean Circulation Experiment
WTO	World Trade Organization
WWW	World Weather Watch
XBT	Expendable Bathythermograph