INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
Reports of Governing and Major Subsidiary Bodies

Thirty-third Session of the Executive Council

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* Report translated into French, Spanish and Russian. For reasons of budgetary constraints, Annexes VI and VII remain in English only.

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1. OPENING

1 The Chairperson, Prof. Su Jilan, opened the 33rd Session of the IOC Executive Council at 10:00 on 20 June 2000.

2 **The Executive Council received and noted** with appreciation the welcoming statements by the Chairperson and by Dr Patricio Bernal, IOC Executive Secretary and Assistant Director-General of UNESCO, on behalf of the Director-General of UNESCO. These statements are reproduced in Annex III Parts A and B.

3 The Secretary-General of the World Meteorological Organization (WMO), Prof. G.O.P. Obasi, was invited to address the Council. His address is reproduced in Annex III Part C.

4 The Director-General of UNESCO, Mr Koïchiro Matsuura, addressed the Executive Council at a later date in the proceeding of the Session. He recalled the role of the IOC in the last forty years in the field of ocean science cooperation and welcomed the new orientations that the Commission has endorsed, as reflected in the new Statutes, which were adopted by the 30th General Conference of UNESCO. He welcomed the recent IOC evaluation, which was commissioned by UNESCO and referred to the ongoing reform process taking place within UNESCO. He informed the Executive Council that the cuts in budget were of a statutory nature and that they were done across the board for all UNESCO programmes, including the IOC and the World Heritage Centre (WHC).

2. ORGANIZATION OF THE SESSION

2.1 ADOPTION OF THE AGENDA

5 The IOC Executive Secretary proposed the inclusion of an Agenda item on Large Marine Ecosystems (LME) under Agenda Item 4.1 "Ocean Sciences". The Delegate of Portugal also proposed the inclusion of a point on DOSS-2 to be covered under Agenda Item 3.3 "Revision of the Rules of Procedure".

6 **The Executive Council adopted** the Agenda as given in Annex I.

2.2 DESIGNATION OF THE RAPPORTEUR

7 **The Executive Council accepted** the proposal from the United Kingdom, seconded by Canada, to designate a Rapporteur from Nigeria. The Nigerian Delegate proposed Mr Larry Awosika from his delegation to be Rapporteur for the Session. This was **approved** by the Executive Council.

2.3 ESTABLISHMENT OF INTRASESSIONAL COMMITTEES

8 A Resolution Committee was approved under the Chairmanship of Second Vice-Chair, Vice-Admiral M. Leal (Brazil), with participation of China, Cuba, France, Nigeria, the Russian Federation and the United States of America.

9 The Chairperson also proposed the establishment of other *ad hoc* sessional groups. In particular, **The Executive Council agreed** on the need for a sessional group on Programme and

Budget under the Chairmanship of the First Vice-Chair, Dr D. Pugh (UK). **The Executive Council noted** that these groups would be open-ended and would meet at times to be announced.

2.4 INTRODUCTION OF TIMETABLE AND DOCUMENTATION

10 **The Executive Council noted** the List of Documents (Document IOC/EC-XXXIII/4 prov.) and the Provisional Timetable (IOC/EC-XXXIII/1 Add. prov. rev.) and adopted it with minor amendments. The List of Working Documents is given in Annex V, the List of Participants in Annex VI, and the List of Acronyms in Annex VIII.

2.5 ROGER REVELLE MEMORIAL LECTURE

11 Dr Peter Brewer, from the Monterey Bay Aquarium Research Institute (MBARI, USA) was the invited speaker for the R. Revelle Memorial Lecture. The topic of his paper was: "*Responding to Climate Change: Scientific questions regarding the possible disposal of CO_2 in the deep ocean"*. The abstract for Dr Brewer's presentation is given in Annex IV.

3. DEVELOPMENTS SINCE THE 20TH SESSION OF THE IOC ASSEMBLY

3.1 RESULTS OF THE 30TH SESSION OF UNESCO GENERAL CONFERENCE

12 The IOC Executive Secretary introduced this Agenda item by referring to the proceeding of the 157th Executive Board and the 30th General Conference of UNESCO (October-November 1999).

13 In the preparation to these meetings and in response to the IOC Assembly recommendation, the Executive Secretary informed the competent national authorities by Circular Letter No. 1624, dated 19 August 1999, of the requirements of the IOC programme and budget in order to obtain their support during the discussion of the programme by the UNESCO Governing Bodies.

14 The 157th Executive Board proposed two modifications to the IOC Statutes as approved by the 20th session of the Assembly: one dealing with the role of IOC in relation to coastal zones, and one on the method of reporting to UNESCO. Following a subsequent debate during Commission III (Science) and then in the plenary session of the General Conference, the decision was made to approve the Statutes as originally submitted by the IOC Assembly. Among other things the General Conference invited the "*Director-General to ensure geographical balance of staff in the Secretariat of the IOC and in particular the recruitment of African scientists*" and called upon *"the IOC Assembly to initiate a system that will allow the equitable participation of scientists from developing countries on the Commission's Executive Council."* (30 C/5, section II.2.4, para. 02240).

15 The Executive Secretary requested that under this item the Executive Council also provide advice on the Medium-Term Strategy for IOC.

16 **The Executive Council congratulated** the Chairperson and Executive Secretary of IOC for their efforts during the General Conference in maintaining the original language of the Statutes and expressed thanks to the UNESCO General Conference for their decisions in support of the IOC Programme.

17 Several Member States stressed the problem of lack of communication and coordination between the national representatives of IOC and those representing Member States at the Governing Bodies of UNESCO. This leads to a poor level of support for the Commission when major issues such as programme and staffing are being decided upon at the UNESCO level. One reason for this problem may be attributed to the fact that several countries do not have a national IOC Committee which coordinates the IOC-related activities and communicates them to the national institutions.

18 **The Executive Council called for** the establishment of simplified arrangements in supporting IOC at the highest level within UNESCO. The Executive Secretary was **urged** to improve communication with the IOC Member States in order to provide them with advanced information of the progress and needs and to allow them to consult and inform their authorities, as well as the UNESCO National Commissions accordingly. In addition Member States were **urged** to strengthen this coordination at the national level, which also calls for the establishment of national IOC bodies as recommended by the IOC Assembly.

19 With regard to the UNESCO's Medium-Term Strategy, **the Executive Council noted** that UNESCO has initiated a process of consultation for the forthcoming Medium-Term Strategy and the programme for the 2002-2003 biennium and stressed the fact that this also provides a unique opportunity for the IOC Member States to act in a concerted manner for the future of the Commission.

20 **The Executive Council adopted** Resolution EC-XXXIII.1.

3.2 PROGRESS REPORT ON THE PROGRAMME AND BUDGET EXECUTION

21 The IOC Executive Secretary referred to the Report on Programme Execution (July 1999 - June 2000) which contains a detailed account of progress in the implementation of the Programme and the Resolutions adopted at the 20th Assembly of IOC.

22 The Executive Secretary recalled that the most relevant and recent event in the United Nations with respect to the oceans was the United Nations open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) meeting which took place in New York, May 26-29, 2000. The UN General Assembly (UNGA) recommended that Ocean affairs should be placed at a high level of political consciousness through the establishment of UNICPOLOS. During the meeting Member States, specialized agencies of the UN regional organizations and recognized NGOs were invited to discuss the issues contained in the last two Secretary General's reports on Oceans and the Law of the Sea.

23 The two main issues addressed in this first meeting were: (i) the effects of overfishing on a global basis; and (ii) the effects of pollution from land-based sources. The unanimous theme, which crossed topics, was Ocean Science. UNICPOLOS agreed in principle that a detailed discussion on Ocean Science should take place next year. The Executive Secretary stated that the results of the UNICPOLOS discussions provide an opportunity for IOC to take the lead in preparing a review of Ocean Science, related services, and capacity building.

24 The Executive Secretary then focused on the successful implementation of the Global Ocean Observing System (GOOS). The IOC is moving full speed ahead with the implementation of the Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) (WMO and IOC), that will provide an instrument for enabling GOOS. The second preparatory meeting of

JCOMM took place in June 2000 in Paris. JCOMM provides an interesting example that shows how two different agencies of the UN can strongly cooperate without losing their independence and identity. There are issues which will have to be addressed by JCOMM, but there is certainty that these challenges will be met. IOC and WMO look forward to the full implementation of JCOMM. A dedicated item on JCOMM in the agenda of this session will provide an opportunity to have more detailed discussions of the progress achieved to date.

25 WMO and IOC are also cooperating in the Integrated Global Observing Strategy (IGOS) Partnership, which also involves national space agencies. The Partnership helps to avoid duplication and to put resources together. The first major decision of the IGOS Partners, was to approve the Ocean Theme as the first thrust to be addressed. The Executive Secretary invited the Executive Council to extend assistance in developing the programme of the IGOS Partners.

26 The Executive Secretary then referred to the progress in the implementation of the Array for Real-time Geostrophic Oceanography (Argo). Currently, the development of Argo is ahead of schedule and moving along rapidly. The goal of 3,000 floats to be deployed (to collect data in the upper ocean) by the end of 2004 seems attainable at this point. This is a significant step forward in creating a permanent observing capacity for the Ocean. This year, Japan hosted a meeting on a regional implementation of the Argo programme which adopted the *Tokyo Declaration* stressing the importance of a regional approach for the deployment of floats. The Executive Secretary invited similar partnerships to be established amongst Member States.

27 The Executive Secretary highlighted the significant progress of the Integrated Coastal Area Management (ICAM) programme in the past year. The IOC/ICAM Programme is committed to providing methodological coastal management tools for Member States. In 1999, a successful meeting was convened in Hangzhou, China, concerning coastal mega-cities. A series of important recommendations were made through the *Hangzhou Declaration*.

28 IOC, in collaboration with the University of Rhode Island and National Oceanic and Atmospheric Administration, USA (NOAA), participated in the development of the "Coastal Zone ’99" meeting. Over 200 participants attended this important meeting. One of the major topics for discussion was the use of *Marine Protected Areas* as a tool for Coastal Management. Marine Protected Areas are an important management tool being used by Member States of IOC and UNESCO. The Executive Secretary invited Member States to facilitate their creation.

29 The Executive Secretary then informed the Council on the developments within UNESCO during the last year. At the 30th General Conference of UNESCO in November, a new Director-General was elected. Dr Koïchiro Matsuura has called for a profound reform process to take place in the organization. UNESCO Member States adopted an option of a zero nominal growth budget. This places a severe impact on UNESCO as a whole. Furthermore, the General Conference, when approving the budget, requested the Director-General to find 10 million US dollars of savings. All programmes were asked to reduce their budgets by a significant amount. IOC budget was in effect reduced by $362,000 (12.2%) this year. This is very significant considering the total budget of IOC. Despite the principle of the incompressible budget granted to the IOC, the Executive Board accepted the proposals from the Director-General on reductions to the Science Sector funding that included reduction to the IOC Regular Programme budget. The Executive Secretary invited the Executive Council to reflect on the possibility of receiving the contribution of UNESCO to the IOC budget as a financial allocation that would improve the financial stability of the Commission.

30 Mrs Grignon-Logerot, member of the IOC Secretariat and in charge of financial matters, complemented the report of the Executive Secretary with a general overview of Document IOC/EC-XXXIII/2 Annex 1 and Addendum on budget execution, and referred to the decisions of the 159th Executive Board of UNESCO (May 2000) on the "savings" requested in the Resolution of the 30th General Conference on Budget. 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 15 June 2000.

31 In the debate which followed, **the Executive Council congratulated** the Secretariat on its accurate and clear report. During the ensuing discussion, answers were given in response to several specific questions in regard to Document IOC/EC-XXXIII/2 Annex 1 Add., particularly on the distribution of the $362,000 budget cut requested by UNESCO and on the evaluation of the impact of this reduction.

32 **The Executive Council recommended** the Chairperson of the Sessional Group on Programme and Budget established under Agenda Items 3.2 and 9 to take the views of the Member States on the cuts and on the budget as a whole into account while preparing a draft resolution.

33 **The Executive Council congratulated** the Executive Secretary for his report. In particular, **the Executive Council expressed its satisfaction** in relation to the role IOC is playing in trying to coordinate actions on ocean and coastal areas within the United Nations (UN) system and through UNICPOLOS. It was especially noted that this new mechanism for global ocean affairs coordination is recognizing IOC as the competent UN body for ocean sciences. **The Executive Council welcomed** the proposal to include the theme on Ocean Science, related services, capacity building and technology on the agenda of the next UNICPOLOS meeting **and called for** the establishment of an intersessional group in order to ensure adequate contribution of the IOC to the forthcoming UNICPOLOS meeting (May 2001). *(See also discussion under Agenda Item 7.2).*

34 The presence and address of the WMO Secretary-General, reflecting the high level of cooperation between IOC and WMO, were noted with satisfaction. Some delegates expressed the hopes that the heads of other relevant agencies of the UN System would also have in the future the possibility to address the IOC Governing Bodies. The Delegate of Portugal made special reference to the agencies members of the Inter-secretariat Committee on Scientific Programmes Relating to Oceanography - ICSPRO (UN-FAO-UNESCO-WMO-IMO).

35 Several Members of the Council were concerned about the inadequate level of staff and budget allocation granted to IOC by UNESCO. Some of them expressed their concern that the limited number of staff in the Secretariat would affect programme implementation. Many expressed their concern with the budget cuts decided by the Executive Board of UNESCO, despite the incompressible budget allocation as approved by Resolution 1 of the 30th General Conference**. The Executive Council stressed** the need to respect the terms of the functional autonomy of the Commission.

36 **The Executive Council stressed** the importance of appropriate representation of the IOC interests at the Executive Board and General Conference of UNESCO. **The Executive Council regretted** that Commission III of the General Conference of UNESCO ignored the IOC Resolution XX-25 calling for an increase in budget and staff allocation.

37 The Chairperson invited the Council Members to submit written summaries of national activities to the Secretariat if they so wish before the end of July 2000 to be annexed to this report.

3.3 REVISION OF THE RULES OF PROCEDURE

38 Following the guidance provided by the IOC Officers at their meeting in January 2000, and taking into account the brief period of time before the Executive Council Session, the Executive Secretary invited past Chairperson Geoffrey Holland, acting as a Consultant, to undertake the task of proposing an updated draft of the IOC Rules of Procedure on the basis of the revised Statutes of IOC adopted by the 30th General Conference of UNESCO in November 1999. He presented this Agenda item for discussion, referring to Document IOC/EC-XXXIII/2 Annex 2, and described the content of the document.

39 The Chairperson invited Mr Garcia-Montero (Cuba), acting as the designated chair of the Sessional Group appointed to analyze the draft of the Rules of Procedure made available through Document IOC/EC-XXXIII/2 Annex 2, to report to the Executive Council. Mr Garcia-Montero informed the Council that the Group held two sessions with the participation of 21 delegates from eleven countries: Argentina, Brazil, Canada, Costa Rica, Cuba, France, Germany, Portugal, Russian Federation, United Kingdom and USA.

40 He reported that, on the issue of modifications to the rules of procedure, positions were divided and no consensus was reached. However the Group succeeded in identifying the main areas of concern and priority for further action:

(i) definition of the rules that should be applicable to the elections of the Officers and Members of the Executive Council, in view of the new instructions contained in Article 5(B) paragraphs 5 and 6 of the new statutes,

(ii) identification of responsibilities of Member States of the Commission, including financial obligations, and

(iii) all those aspects that bear on the effective functioning of the organization, including those pertaining to the Secretariat and the Chairperson.

41 In opening the debate, the Chairperson invited the Executive Secretary to summarize the situation.

42 The Executive Secretary recalled that in April 1998, the *ad hoc* Study Group on IOC Development, Operations, Structure and Statutes (DOSS-2) held its last substantive discussion on the new statutes, on which occasion it was agreed that the Chair of the group, Dr Manuel Maria Murillo (Costa Rica), would complete the final draft and consult with the group by correspondence. On that occasion the Group also agreed to separate the task of completing the statutes from that of drafting the new rules of procedures, until the final approval of the statutes.

43 The successful completion of the statutes by the Chair was followed by the review of the text in a brief meeting of DOSS-2 during the 31st Executive Council (Nov. 1998), before to its final endorsement by the 32nd Executive Council and final approval by the 20th IOC Assembly (July 1999). Further endorsement was provided by the Executive Board and the 30th General Conference of UNESCO. This completed the process of approval of the statutes.

44 This long process created a situation in which DOSS-2 faced the end of its mandate (at the date of the 20th IOC Assembly) without having finalized the rules of procedure. For that reason,

the 20th IOC Assembly, addressing this issue, included in its report the request to the DOSS-2 Group to finalize its task (IOC-XX/3, para. 48).

45 The Executive Secretary went on to note that this situation was not abnormal, since in any institution whenever a change in laws, by-laws or rules took place, there is an inherent need to harmonize the new legal precepts with the pre-existing ones, and there are standard administrative and legal procedures to enable this to happen. He stressed the fact that, in any case, the IOC has today a valid statute and a valid set of rules of procedure. He confirmed that those were fully in place, and that the existing rules of procedure should be considered as valid in everything in which they did not contradict the new statutes.

46 He expressed the view that a completely different matter was the depth of the revision required for the rules of procedure. In this matter there are two options: first, to go with an adaptative approach, conducting a formal revision of existing rules to make them compatible with the obvious statutory changes; and second, to conduct an in-depth revision with the purpose of designing more effective rules. He expressed his opinion that these two options were both legitimate and that this was a valid issue to be dealt with by the Executive Council on its own merits.

47 **The Executive Council noted** that the IOC Assembly at its 20th Session *"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 33rd Session of the Executive Council*" (Document IOC-XX/3, para. 48).

48 It was agreed that the sessional group under the chairmanship of Mr Garcia Montero and composed of Members of the DOSS-2 and other delegates, would be established and would undertake a preliminary exchange of views and evaluate the need for future work.

49 Several delegations argued in support of having the DOSS-2 Group finish its task as recommended in the report of the 20th IOC Assembly, paragraph 48, suggesting several ways to expedite the task by resorting to electronic communication. Other delegations were in favour of a more expedient treatment of the matter by using the ready available draft contained in document IOC/EC-XXXIII/2 Annex 2, and favoured the immediate discussion of the rules necessary to conduct the elections of the Officers of the Commission under the new statutes. After a long discussion **the Executive Council reached a consensus** that the IOC needed a thoroughly reviewed set of rules of procedure, not only to adapt them to the new statutes but also to introduce new and more effective procedures.

50 **The Executive Council recommended** that the DOSS-2 Group review the existing draft, giving priority to the election rules, and conduct its business through electronic consultations as much as possible but finalizing its work in a meeting of DOSS-2 not later than the end of 2000. **The Executive Council agreed** that the final version of the revised rules of procedure should be made available at least four months before the next Assembly.

51 The Delegate of Costa Rica expressed its satisfaction for the agreement reached and informed the meeting that Dr Murillo, as Chairperson of the DOSS-2 Group, was willing and ready to undertake this important task for the Commission.

3.4 EXTERNAL EVALUATION TEAM REPORT

52 Dr J. Field, the President of the Scientific Committee on Oceanic Research (SCOR) introduced this Agenda item in his capacity of a member of the Evaluation Team. He referred to the decision of the 29th General Conference of UNESCO to request an independent evaluation of the IOC and the subsequent nomination by the Director-General of UNESCO of a Team of External Experts in March 1999. He then introduced Document IOC/EC-XXXIII/2 Annex 3 containing the results of the evaluation.

53 Dr Field informed the Council that the Team, headed by Dr J. Zillman, President of the WMO, made a detailed review of the capacities and capabilities of IOC in carrying out its mission, assessed the current effectiveness of IOC programmes and of its administrative effectiveness and efficiency, and provided recommendations for future IOC activities and related administration.

54 Dr Field emphasized that IOC is performing a vitally important role in international earth system science. However, improvement is needed in a number of areas including the arrangements for national representation, regional coordination arrangements, the Secretariat management, and cooperation with other international organizations. Dr Field stated that the IOC Programme has an enviable record of achievement over many years but has become too unfocussed and thinly spread to be adequately carried out with resources available. There is a need for more strategic leadership and a more focussed programme with fewer elements.

55 Finally, he referred to the recommendations for action contained in the external evaluation report by:

(i) UNESCO - to provide resources within UNESCO and preserve the statutes and the principles of the IOC functional autonomy as approved by the UNESCO Governing Bodies;

(ii) IOC Governing Bodies and Secretariat - to conduct strategic planning and prioritization; to implement modern financial and staff management practices;

(iii) Member States - to establish and coordinate national committees of IOC, to invest funds and human resources.

56 After a long discussion **the Executive Council** unanimously **concluded** that the preparation of the Report was most timely and the evaluation provides a unique opportunity for UNESCO to assist nations to reap the enormous benefits potentially available from marine research and operational oceanography in the twenty-first century. **The Executive Council thanked** the Members of the Team, consultants, and the Secretariat for the work done and expressed a strong wish that the conclusions and recommendations of the Evaluation Report be brought to the attention of the UNESCO Governing Bodies for their consideration and action as appropriate.

57 **The Executive Council called on** the IOC focal points in the Member States to provide necessary briefing to their national delegations to promote major findings of the External Evaluation Report at the UNESCO Executive Board and General Conference.

58 **The Executive Council expressed concern** about the plan to amalgamate the IOC External Evaluation Report with the evaluations made within other UNESCO sectors and programmes, to be presented to the coming UNESCO Executive Board session. **The Executive**

Council invited the IOC Chairperson and Executive Secretary to take all necessary steps to present the IOC External Evaluation Report as a separate document.

59 **The Executive Council noted** that the Conclusions and Recommendations of the Report deserve more attention, discussion and in-depth studies. The IOC Executive Secretary was **instructed** to prepare a plan of action and timetable for implementing the Recommendations in the ambit of the IOC and to submit it to the next Assembly.

60 Following an extensive debate over the Evaluation Team Recommendation *"…that UNESCO sponsor and approve the progressive development of the IOC as the UN specialized agency for the oceans, formally within the UNESCO framework…*", the Delegate of Canada stated his view that the language used in the External Evaluation Report was both fully understood and carefully crafted by the members of the Evaluation Team to convey the message of the potential future evolution of the Commission.

61 **The Executive Council adopted** Resolution EC-XXXIII.2.

4. PROGRAMME MATTERS REQUIRING DECISIONS BY THE EXECUTIVE COUNCIL

4.1 OCEAN SCIENCES

4.1.1 Oceans and Climate

62 **Ocean Observation Panel for Climate (OOPC).** Mr Arthur Alexiou from the IOC Secretariat briefed the Council on the progress being made by the OOPC towards implementing an ocean observing system for climate, *i.e*. the Climate module of GOOS. The main focus of its efforts since the Assembly last year was the First International Conference on Ocean Observations for Climate (OCEANOBS'99) held in St Raphaël, France, 18-22 October 1999, convened by the joint forces of the WCRP's CLIVAR Upper Ocean Panel and the GOOS/GCOS/WCRP Ocean Observations Panel for Climate. The landmark event turned out to be a compelling demonstration of the power of integrating and meeting diverse requirements with a single multi-purpose system and served to facilitate consolidation of desired ends. Consensus was reached on what has to be done, and on why and how to do it. The participants produced a *Conference Statement* (IOC/INF-1137) which signalled a new era in oceanography, one where sustained global observations are acquired and useful data products are widely shared in near real-time on an unrestricted basis.

63 **The Executive Council recognized** the importance of OCEANOBS'99 to meeting the GOOS goal, and **endorsed** in principle the Conference Statement on data policy in so far that it calls for rapid dissemination and wide sharing of data to be the norm rather than the exception.

64 **Global Ocean Data Assimilation Experiment (GODAE).** Mr Alexiou informed the Council of the results of the meeting of the International GODAE Steering Team (IGST) held on 15-18 May 2000 in Southampton. The members of IGST played key roles in OCEANOBS'99 and were able to draw out areas of consensus and make credible assessments of the degree of involvement that could be expected from nations represented. Thus the meeting was able to rapidly complete the final draft of the GODAE Strategic Plan and to set in motion the work to develop an Implementation Plan.

65 **Array for Real-time Geostrophic Oceanography** (**Argo).** The Argo Science Team met on 7-9 March 2000, in Southampton. Though the technical issues have not all been overcome, good progress is being made toward achieving the standard for temperature of 0.005ºC and salinity of 0.01 over 4-5 years, the target for nominal useful float life. Float contributions targeted over the next three years were listed as follows: Australia 90, Canada 150, European Union 80, France 150, Germany 150, Japan 300, Republic of Korea 75, UK 150, USA 1125. India confirmed that a decision had been reached to join the Argo project and that the country will contribute 25 floats/year for three years with the possibility of more in the future if necessary. Mr Alexiou also informed the Council of the action taken in response to Resolution XX-6 of the 20th Session of the IOC Assembly. 24 replies have been received in response to a request by IOC to all Member States to designate national contacts. An Argo Information Centre is being formed in conjunction with the Data Buoy Cooperation Panel (DBCP) and the Ship-of-Opportunity Programme (SOOP). It will track floats and provide national contacts with exact information of float deployments. The USA, UK, Canada and France have agreed to contribute to the cost of the centre. Additional support is needed.

66 The Delegate of Japan informed the Council that his government had recently allocated special funds in 2000 - 2004 for launching the national Argo Programme as part of the "Millennium Project" in Japan. He stressed the importance to Argo of national and regionally coordinated efforts and brought the attention of the Council to the Pacific Argo implementation meeting convened in Tokyo on 13-14 April 2000. Experts from Australia, Canada, France, Republic of Korea, the US and Japan as well as representatives from PICES, IOC, WMO and SOPAC participated. The meeting adopted the *Tokyo Statement* which emphasized the importance of broad regional approaches to a global implementation strategy for float deployments.

67 The Delegate of Portugal indicated his government hoped to join Argo in the future and commented on the implications it may have in connection to the use of EEZ of countries. Perhaps IOC could act on behalf of Member States in this regard.

68 The Nigerian Delegation urged that the Argo activities be extended to cover both IOCEA and IOCINCWIO regions.

69 **The Executive Council re-affirmed**, as was stated in the IOC Resolution XX-6, that the Argo project was accepted by IOC Assembly 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.

70 **Word Climate Research Programme (WCRP).** Dr David Carson, the newly appointed Director of the WCRP, addressed the Council on the research priorities for the next decade and reviewed the evolution of coupled model development starting with the basic atmospheric model and increasing the complexity in stepwise fashion with the addition of models for land, the ocean, sea ice, aerosols, the carbon cycle and atmospheric chemistry. The observations for achieving realism in these models are only now becoming available, and programmes like GOOS are essential to coupled model improvement. He emphasized that achieving the long-range goals of WCRP projects like CLIVAR will require closer collaboration between the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme (IHDP) and other associated international programmes. Dr Carson thanked IOC for its support to the WCRP and made a strong case for continuing this support as WCRP resources are becoming increasingly stretched.

71 **OCEAN CO_2.** Mr Alexiou informed the Council of the completion of the joint action by IOC and SCOR to replace the IOC-JGOFS Ocean CO_2 Advisory Panel with a new SCOR-IOC panel with new terms of reference (IOC/INF-1136) that reflect the CO_2 issues that are important today and the state of the science for addressing them. Dr Douglas Wallace of the Kiel Institute will chair the new panel.

72 Mr Alexiou noted that CO_2 issues are intruding increasingly on policy-makers time. Questions are being asked that the science is not ready to answer. The question of preventing large volumes of CO_2 from entering the atmosphere is receiving greater attention in industry and the press and this subject is referred to in the new terms of reference. The possibility of sequestering CO_2 in the ocean deep as an option is being widely debated and preliminary experiments have been conducted in several countries.

73 Dr Peter Brewer, CO_2 expert and Senior Scientist at the Monterey Bay Aquarium Research Institute was invited to inform the Council on this subject. He discussed the dimensions of the CO_2 problem and the state of the science and technology for providing guidance for governments on controlling emissions or mitigating their effects. No matter which models are used to compute the economic and environmental choices in the stabilization of atmospheric CO_2 concentrations as agreed to in the *Kyoto Protocol*, the results all give a similar message. The actions needed by governments to comply with Kyoto requirements are daunting. The fact that oceans have a large capacity for the absorption of CO_2 makes them an inviting option. Would CO_2 disposal in the ocean be a wise choice among other potential options? There is no answer today and there are other enormous unanswered questions. Dr Brewer encouraged the IOC to promote a policy of engagement around this issue that is so far lacking among governments. He stressed the need for engagement that includes evaluating at a high level the scientific underpinnings of direct ocean CO_2 disposal as one of the possible means of holding future atmospheric CO_2 levels "*at a level that would prevent dangerous anthropogenic interference with the climate system*".

74 Dr Gunnar Kullenberg, Director of the International Ocean Institute (IOI) reminded the Council that IOC had addressed the issue of CO_2 disposal in the ocean in 1996. That exercise, in a GESAMP report, concluded that the subject should be kept under surveillance and that the science available at that time was insufficient for making sound evaluations.

75 **The Executive Council endorsed** the Terms of Reference of the new IOC-SCOR Advisory Panel on CO_2 and **agreed** that there is a need for scientific research on possible benefits and side effects of disposing CO_2 in the deep ocean. The absence of such research weakens the constraints on the debate about the options for controlling levels of atmospheric CO_2. Scientific understanding is necessary before the global agenda proceeds. There is also a need to consider the role the IOC can play to coordinate associated efforts on the part of Member States. The Executive Secretary was **encouraged** to pursue, with appropriate UN bodies, research on CO_2 disposal in the oceans so that this issue can be brought to the attention of forthcoming meetings of the Conference of the Parties to the UN Framework Convention on the Climate Change at COP-VI (The Hague, 13-24 November 2000) and to the contracting parties of the London Convention (LC) on the Prevention of Marine Pollution by Dumping of Wastes and other Matters (1972). This latter convention is important because if CO_2 were deemed to be an industrial waste, then parties to the LC, 72 to date, would be prevented from dumping it into the ocean, unless the provisions of the London Convention were to be amended.

76 The Delegate of Germany regretted that earlier notice of this issue was not available. He noted this as another case where governments did not have information in the time needed to prepare a considered national position.

4.1.2 Census of Marine Life

77 The Technical Secretary in charge of Ocean Science in Relation to Living Resources (OSLR), Dr Ned Cyr, and the Programme Director for the Census of Marine Life at the Alfred P. Sloan Foundation, Dr Jesse Ausubel[1] introduced this Agenda item, referring to *Oceanography*, Vol.12, no. 3, a special issue on the Census of Marine Life.

78 The Technical Secretary and invited speaker noted recent progress made toward implementation of the Census, including the formation of an International Scientific Steering Committee, and the announcement of awards to support development of the Ocean Biogeographical Information System (OBIS). OBIS will underpin the entire Census by providing an enhanced framework for the management of the complex biological and ecological information that will result from it.

79 The Technical Secretary and invited speaker also noted the relevance of the Census to the IOC. The Census has the potential to expand significantly our knowledge of the biodiversity in the world's oceans. The programme will contribute to the Living Marine Resources Module of GOOS, providing synoptic information on status of the marine ecosystems which GOOS can use as a baseline to assess future changes. Several delegations supported the programme and recommended the involvement of national focal points in Member States as well as linkage to other IOC programmes.

80 **The Executive Council expressed** support for the Census, and **instructed** the IOC Secretariat to develop an appropriate mechanism for IOC involvement in the Census taking into account budgetary constraints and the existing priorities of the Commission. Reference was made to the need to coordinate activities of the Census with other appropriate international activities such as the Diversitas Programme and the Global Biodiversity Information Facility.

81 **The Executive Council noted** that some IOC Member States had identified national IOC focal points to coordinate their involvement with programmes such as the Census, and all Member States were **encouraged** to identify national IOC focal points. **The Executive Council recognized** the potential implications of the information arising from the Census for the conservation and management of fish stocks within national EEZs, and the particular need therefore to coordinate Census activities on a national basis.

4.1.3 Harmful Algal Blooms (HAB) Programme

82 The Chair of the IOC Intergovernmental Panel on Harmful Agal Blooms (IPHAB), Dr Adriana Zingone (Italy), introduced this Agenda item by recalling that the activities of the IOC/HAB Programme is based on a comprehensive programme plan with the overall goal to foster the effective management of, and scientific research on, harmful algal blooms. The IPHAB has the task of directing the HAB Programme activities by setting priorities, identifying resources and making plans for future initiatives.

[1] Dr Ausubel's remarks are on-line at http://core.cast.msstate.edu/censioctalk.html

83 Dr Zingone then reported on the Fifth Session of the IPHAB, which was held 22-24 November 1999 at UNESCO Headquarters in Paris. The Panel reviewed the actions completed by the HAB Programme in the last three years and decided upon the work plan for the coming years. The Executive Council was presented with the Report, Resolutions, and Recommendations of IPHAB-V (Document IOC/IPHAB-V/3).

84 Dr Zingone highlighted the significant training and capacity building activities, the databases established for the IOC www-server, and the publications in preparation. In the last part of her introduction, the Chair IPHAB reported on one of the most challenging initiatives that have been undertaken within the HAB Programme. This is the IOC-SCOR Science Programme GEOHAB, the Global Ecology and Oceanography of Harmful Algal Blooms, which was adopted by the 31st Session of the Executive Council in 1998.

85 The mission of GEOHAB is to foster international, cooperative research on HABs in ecosystem types sharing common features, comparing the key species involved and studying the oceanographic processes that influence their population dynamics. A GEOHAB International Scientific Steering Committee, chaired by Dr Patrick Gentien (France) has been established, and has met three times in the last year to draft the GEOHAB Science Plan, which is now almost ready. The Executive Council was presented with the Executive Summary and an outline of the Science Plan elements.

86 The Chair IPHAB emphasized that the implementation and development of GEOHAB strongly depends on the support of individual countries as well as of regional organizations. Dr Zingone recalled that France has offered to host the Programme Office at IFREMER, in Brest, and USA has offered to explore the possibility for providing support. However, support from other Member States is required to meet the needs for adequate staffing of the Office. This may come either through full secondment by a single country, or through pooling of resources. The Chair IPHAB called upon Member States to actively contribute to the development of GEOHAB and expressed readiness to provide interested Member States with work plans and budget to document funding requirements.

87 The Chair IPHAB concluded her introduction by recalling the operational structure of the HAB. The Programme Office in the IOC Secretariat in Paris is presently staffed half time by Mr Ole Vestergaard, seconded by Denmark. The HAB Project Coordinator, Mr Henrik Enevoldsen, is located in Denmark at the IOC Science and Communication Centre, with two other locally hired people. A second IOC Science and Communication Centre is established in Vigo, Spain, with one locally hired staff member. Finally, some activities are based on the volunteer work of *ad hoc* task teams, which are formed within the Intergovernmental Panel but also includes external members.

88 There was keen interest from the Executive Council, with 21 delegations intervening.

89 **The Executive Council noted with concern** that harmful algal bloom phenomena continue to be a major problem in a high number of Member States.

90 **The Executive Council noted with appreciation** the Report of IPHAB-V and the results achieved. It **referred** to the HAB Programme as one of the most important and visible programmes of the IOC, and to the developement of the HAB Programme in close cooperation with the global science community as a good example of what IOC can do. **The Executive Council acknowledged** that the HAB Programme is developing on a solid scientific basis. This is

the reason why it has been possible to achieve good practical results. **The Executive Council also noted** the relevance of several HAB Programme activities to GOOS.

91 **The Executive Council expressed its support** for the decentralization strategy for implementing the HAB Programme through the Science Centres of Vigo, Copenhagen and the WESTPAC Programme, and **expressed** in that context its appreciation of the support of Denmark, Japan and Spain. **The Executive Council welcomed** with appreciation the renewed secondment by Denmark of an Associate Expert for the IOC Secretariat.

92 **The Executive Council appreciated** the progress made in developing GEOHAB, and gave strong endorsement to its further development. In relation to the IPHAB-V Recommendation on the establishment of national committees for GEOHAB, one delegate noted that there might be a danger of fragmentation of the IOC focal point in Member States if separate committees for individual programmes are established outside their sphere of coordination. Instead, focus for all activities ought to stay with the National IOC Committees. Other delegates stressed that it could be left to each Member State to decide on how to organize itself most expediently. **The Executive Council encouraged** furthering national linkages with GEOHAB, preferably through or in close liaison with the National IOC Committee or equivalent body.

93 The Delegate of France confirmed that it is willing to host the International Programme Office (IPO) for GEOHAB and that it is in the process of settling the financial arrangements. **The Executive Council welcomed** the offer by France to host the GEOHAB IPO.

94 The Representative of the Scientific Committee on Oceanic Research (SCOR) confirmed the strong commitment of SCOR to GEOHAB and expressed satisfaction with the cooperation with IOC in this regard. The Representative of SCOR addressed the need for additional resources for further developing GEOHAB and strongly encouraged Member States to support through the IOC and SCOR.

95 The Delegate of Canada in his capacity as President of the International Council for the Exploration of the Sea (ICES), drew attention to ICES' involvement in HAB activities in collaboration with the IOC, and the involvement of ICES in the development of the GEOHAB programme. **The Executive Council welcomed** the cooperation with ICES regarding GEOHAB.

96 **The Executive Council recommended** that a new priority for the HAB Programme should be establishing an improved dialogue with the user community such as managers of the coastal zone, aquaculture industry, etc. High priority should also be maintained on HAB training and capacity building, and on strengthening regional activities with a view to giving the regional activities more and more importance, including cooperation with relevant regional organizations like ICES, the North Pacific Marine Science Organization (PICES), and regional marine environmental Conventions (OSPAR and HELCOM). The Delegate of Canada noted that the financial implications of the recommendations far exceeded the available regular budget and anticipated extrabudgetary resources. He expressed concern that the IOC not unduly raises expectations which may not be fulfilled because of inadequate financial resources.

97 **The Executive Council adopted** Resolution EC-XXXIII.3.

4.1.4 Marine Science Inputs to Integrated Coastal Area Management (ICAM)

98 The Technical Secretary, Mr Julian Barbière presented this Agenda item referring to documents IOC/INF-1140 (*Summary Report of the Group of Experts on Submarine Groundwater Discharges in the Coastal Zone*), IOC/EC-XXXIII/2 Annex 4 *(*Oceans 21 *Development Plan*), and the Hangzhou Report on Coastal Mega-cities (IOC Workshop Report 166).

99 The Technical Secretary briefly provided a summary of activities since the last session of the Assembly. These included the International Workshop on Coastal Mega-cities, which focused on the theme of "Challenges of Growing Urbanization of the World's Coastal Areas" held in Hangzhou, China from 27-30 September 1999, and co-organized by IOC, the International Ocean Institute (IOI), the State Oceanic Administration of China (SOA) and with financial support of SIDA. This meeting was attended by 50 participants including representatives of mega-cities, social and natural scientists, and international organizations such as the World Bank and UNEP. The *Hangzhou Declaration*, which was adopted by the meeting, is calling for the recognition of the Integrated Coastal Management (ICM) concept as an appropriate tool to address management and planning of urban coastal areas. It also called for the establishment of a network of coastal mega-cities to provide a global forum for exchanges of information and experience on coastal urban planning, science, technology and education.

100 IOC has just published a concise methodological guide on coastal sensitivity mapping in collaboration with the Indian Ocean Commission and with the kind support of France following the Seychelles Atlas on sensitivity of the coastal zone (IOC Manuals and Guides 38).

101 The Technical Secretary referred to the Global Website on ICAM (http://www.nos.noaa.gov/icm/), co-sponsored by IOC, NOAA, the World Bank and University of Delaware. It now includes information on ICAM for 20 countries, and product-oriented sections have been added on International Guidelines and International Prescriptions. Initial contacts have been established to consider the possibility of having this website jointly sponsored by the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, serving as the clearinghouse component of ICAM for the GPA.

102 The Technical Secretary informed Member States on the preparation of the second phase of the Inter-disciplinary Study of Coastal Processes Programme (COASTS), the goal of which is to develop the coastal ocean scientific and technical basis necessary for the management and health of the coastal seas. As COASTS-I (1994) focused mainly on physical processes, the planned COASTS-II (Paris in January 2001) will initiate the preparation of an overview and synthesis of interdisciplinary global coastal ocean science (physical-biological-chemical-geological). Special attention will be given to the scientific applications issues. SCOR is a co-organizer of this event.

103 Following Resolution XX-5 of the 1999 IOC Assembly, the Group of Experts on Submarine Groundwater Discharges in the Coastal Zone met in Paris (2-4 February 2000) and was attended by IOC, LOICZ, IHP, GOOS, CSI and SCOR representatives. This group has developed the first draft of a plan for implementing the SGD project. The International Hydrological Programme (IHP) of UNESCO has been invited to participate in the project as well as the International Atomic Energy Agency (IAEA). Dr Kontar, co-Chairperson of the group presented the project to the Council, including its expected outputs, financial implications and *modus operendi,* as contained in document IOC/INF-1140.

104 In the framework of the IOC-IGU cooperation, a joint project *Oceans 21* was established in 1999. On behalf of the International Geographical Union (IGU), Mr Stefano Belfiore presented the IGU perspective on the *Oceans 21* project, which represents an important opportunity for IOC and IGU to collaborate on the development and implementation of interdisciplinary approaches to coastal research and education. Geography is a discipline favouring communication between science and policy, with particular attention to the spatial consequences of sea-level rise, increasing human pressure and urbanization, and the geographical dimension of the international regimes of the sea.

105 The first meeting of the Steering Committee took place in 1999. The Committee drafted the implementation plan, which provides framework for the integration of physical and human geography with social and natural sciences. The programme will produce communication, educational and training tools targeting coastal policy makers, planners and managers. IOC-IGU Dossiers will provide guidance materials on general and specific environmental and coastal management issues at the national, local and regional scale. To optimize efforts, the programme will be developed and implemented in coordination with existing initiatives of UNESCO.

106 Finally, the Technical Secretary recalled that the IOC Advisory Group of Experts on ICAM last met in October 1998. He proposed to the Council that the second advisory group of experts should meet prior to the next session of the Assembly, so as to harmonize its position and role within the redefined Ocean Sciences Programme, and to provide guidance to the Executive Secretary on future directions for its development.

107 **The Executive Council gave its full support** to the ICAM programme **and commended** ICAM on the impressive progress made since the last Assembly.

108 **The Executive Council gave its full support** to the SGD project, **emphasized** that the effort should be well coordinated by IOC, SCOR, LOICZ and IHP, **and asked** that the application of these results to coastal management be highlighted.

109 The Observer from the Islamic Republic of Iran offered to serve as a focal point of the SGD project for the Caspian Sea, and expressed readiness to cooperate with other countries of the IOCINDIO region to facilitate the exchange of data and intercalibration exercises.

110 The Delegate of Australia mentioned that Australia is sponsoring an initial experiment of the SGD project, which will take place in Perth in November 2000. He encouraged national contributions in the form of cooperative ventures between hydrological and marine research communities for the future experiments.

111 The Representatives of SCOR and LOICZ are supporting the SGD project through SCOR/LOICZ Working Group 112, and encouraged the IOC Executive Council to support this effort.

112 **The Executive Council recommended** that IOC should support the SGD project, emphasizing the facilitating and coordinating role that the IOC should play. **The Executive Council suggested** that the participants of the SGD project seek support from national agencies and invited other organizations to financially contribute to the implementation of the programme. IOC financial contribution should only be in terms of seed funding to the project.

113 **The Executive Council welcomed** the development of the *Oceans 21* project and emphasized the importance of intersectoral collaboration. *Oceans 21* should be presented in the

context of the Joint Statement of the Chairpersons of the Five Intergovernmental Scientific Programmes of UNESCO, and other UNESCO scientific programmes should be invited to participate. The Delegate of Cuba noted the need for the *Oceans 21* project to work on a regional level and through regional activities. He invited the participants of *Oceans 21* to participate in the "Toward greater integration of Science in the management of Marine Resources" meeting to be held in Cuba in December 2000.

114 The Delegate of Japan welcomed the developments of the *Oceans 21* project, but expressed its concern with regards to the establishment of a sub-project on "Deep Ocean Monitoring". He invited IOC and IGU to concentrate their efforts on coastal monitoring systems and on the development of socio-economic indicators.

115 The Delegate of Canada expressed concern about the breadth of the *Oceans 21* plan in relation to the available resources. Canada offered to host a workshop in 2001 on an "Ocean Management Theme" to be decided in consultation with the IOC and also invited IOC to play an active role in the international Coastal Management Conference taking place in Canada in September 2000.

116 The Representative of the International Ocean Institute (IOI) expressed his support for the Hangzhou Coastal Mega-cities Workshop and invited IOC to continue its cooperation with IOI on the issue of coastal urbanization as well as on coastal management of rural areas.

117 The IOCEA Vice-Chairperson expressed his support for the SGD project and ICAM programme in general and noted that the SGD project could be integrated into the on-going development of ICAM plans for the western African region.

118 **The Executive Council recommended** that the second meeting of the IOC Advisory Group of Experts on ICAM be convened during the intersessional period to review progress achieved and identify new directions. **The Executive Council invited** the Chairperson of the Group to report the results of the meeting to the 21st Session of the IOC Assembly.

4.1.5 Restructuring the Global Investigation of Pollution in the Marine Environment (GIPME) Programme and Strategic Plan

119 The Head of the Ocean Sciences Programmes Section at IOC, Dr Umit Unluata, introduced this Agenda item by referring to recent activities carried out under the GIPME framework. He drew the attention of the Assembly to the Document IOC/EC-XXXIII/2 Annex 5, *Summary of a Revised Framework for Scientific Activities within IOC Ocean Science relating to Global Investigations of Pollution in the Marine Environment (GIPME)*, that had been prepared in response to IOC Resolution XIX-4. He reminded the Council that the 20th Session of the Assembly had emphasized the need to expedite the restructuring of GIPME and had asked that concrete steps for the implementation of the new structure taking full account of regional interests should be prepared for the 33rd Session of the Executive Council (IOC-XX/3, para. 85-93).

120 Dr Unluata noted that the Document IOC/EC-XXXIII/2 Annex 5 summarizes (i) the results of a re-evaluation of the scientific activities within the GIPME Programme, both in the context of new perspectives of damage and threats to the marine environment, its resources and amenities, and (ii) scientific advances made in the last two decades. The document notes that an additional reason for reviewing the existing framework for the implementation of the GIPME Programme at this time is that much has changed in the field of marine pollution in the 24-year

period since the original design of the GIPME Programme. These changes result not only from improved scientific understanding of the oceans and the mechanisms by which contaminants enter, circulate and are removed from the marine environment, but also from changing perspectives on threats to the ocean.

121 Dr Bewers, the Chairperson of GIPME, then presented the interim conclusions of the GIPME review document summarized in IOC/EC-XXXIII/2 Annex 5. These conclusions have been formulated in the context of two caveats: first, that the relationship between GIPME and HOTO spelled out in Resolution XIX-4 be reflected in future activities; and second, that GIPME avoid undue emphasis on topics addressed within other major international programmes.

122 It is proposed in the review document that GIPME comprises two major categories of activity:

1. Transport, cycling, fate and effects of contaminants; and
2. Development of indicators of marine environmental conditions and effects.

123 Category 1 should emphasize nutrients, principally nitrogen, sediment movement, and less persistent synthetic organic pesticides now in increasing use. In large part, these studies can be conducted within national and regional scientific programmes and the results assimilated for the purposes of global and regional applications.

124 Category 2 reflects the need for more attention on the identification of indicators for pragmatic management application in a wide variety of assessment, environmental protection and observing programmes. Such indicators are being developed for specific applications in other *fora* such as the Organization for Economic Cooperation and Development (OECD), the Global International Waters Assessment (GIWA) and the European Community, as well as many national jurisdictions. The specific *foci* proposed for this category are: human health indicators, benthic marine indicators of condition; and the further development of Rapid Assessment of Marine Pollution (RAMP) techniques.

125 Dr Bewers noted that the detailed review of GIPME would be further revised in the light of the results of the IOC Sciences Programmes Review, to ensure that the GIPME plan is consistent with the evolving science programme of the IOC.

126 Several delegations endorsed the proposed GIPME restructuring, making observations and suggestions for further refinement of the document. In particular, some delegations questioned the degree of restriction to pesticides among organic compounds and the extent to which it was warranted to limit GIPME attention to fisheries and climate change issues. It was suggested that water column indicators be included in the revised programme, taking into account sediment-water column interactions. Bearing in mind the fact that the new focus of GIPME is linking causes and effects it was also pointed out, that the RAMP elements of the programme should concentrate on effects that can be linked to known or suspected causes. Concern was also expressed that endocrine disrupters had not been selected for core activity.

127 In response Dr Bewers explained that the exclusion of fisheries issues referred to the effects of fishing on the environment, which was a matter being adequately addressed in other *fora*; however GIPME would continue working on the issue of the effects of contaminants on the health and marketability of fish. The limitation on organic compounds was intended as an interim one, until the conclusions of negotiations on Persistent Organic Pollutants (POPs), the results of the Global Environment Facility (GEF) Regionally-Based Assessment of Persistent Toxic

Substances, and further clarification of the extent of endocrine disruption within the marine environment become available.

128 **The Executive Council commended** those responsible for the preparation of the document and its adoption of a broadened and multidisciplinary approach to addressing issues of marine pollution. **The Executive Council noted** that the restructuring process is not yet complete and that the final proposals should be available for consideration at the next Assembly with a view to their endorsement and adoption at that time.

129 **The Executive Council recommended** the development of manuals on the application of indicators, and encouraged strong interactions among GIPME, GOOS and ICAM with greater emphasis on regional activities. **The Executive Council further recommended** wider interactions with IOC regional bodies and the UNEP Regional Seas Programme.

4.1.6 Review of the Framework of IOC's Existing Ocean Sciences Programmes

130 Dr George Grice from the Secretariat provided progress reports on scientific reviews of the Ocean Sciences Programme (OSP) and the Ocean Science in relation to Living Resources Programme (OSLR). Two review panels were appointed. The OSP panel met on 29-31 May 2000. The OSLR will meet on 17-18 July. The verbal report was **favourably received** by the Council. This progress was **welcomed** by the Council who **noted** that the panels' final reports would be provided to the next session of the Assembly.

4.1.7 Large Marine Ecosystems (LME)

131 Dr Ned Cyr, from the IOC Secretariat introduced this Agenda item, referring to the IOC-IUCN-NOAA Large Marine Ecosystem Consultative Committee Meeting, hosted by the IOC on 13-14 June 2000.

132 It was noted that the LME approach has been included in the Global Environment Facility's (GEF) Operational Strategy, and LME monitoring and assessment projects are now completed or underway in the Guinea Current LME, Benguela Current LME, Baltic Sea LME and Yellow Sea LME. Projects are planned for the Humboldt Current LME, Canary Current LME, Agulhas Current LME, Caribbean Sea LME, and for a second phase of the Guinea Current LME. These country-driven projects are based on an interdisciplinary five-module strategy, which collects information on productivity and environmental variability, fish and fisheries, pollution, socio-economics and governance.

133 It was further noted that over 50 IOC Member States are now involved in LME monitoring and assessment projects, and over $38 million have been provided by the GEF to support LME projects. Projects totalling approximately $75 million are under consideration.

134 The Consultative Committee made several specific recommendations with regard to the IOC’s further role in LMEs, including: (i) the IOC Secretariat should help foster collaboration between GEF-supported LME projects and fundamental large-scale marine research underway or planned; (ii) coordination between LMEs and LMR-GOOS be further strengthened; and (iii) the ACC Subcommittee on Oceans and Coastal Areas should take note of the growing number of LME projects among UN Member States, and assist in coordinating the involvement of the UN agencies involved in LME projects and in promoting the LME approach within the UN system.

135 The Delegate of China reported that the Yellow Sea LME Project has been approved by the GEF Council at a level of $14 million, and called for the involvement of WESTPAC, including the Democratic Popular Republic of Korea, in the project.

136 The Delegate of Nigeria noted progress made in the development of a Phase II of the Guinea Current LME Project, and the establishment of an Inter-Ministerial Council which resulted from Phase I of the project, and which serves to coordinate marine ecosystem research and management in West Africa. The Delegate of Canada noted the lack of documentation on the recommendations arising from the Consultative Committee Meeting and cited that as an example of the need to improve the way the Council conducts its business.

137 **The Executive Council noted** this effective project management structure.

138 In view of the scientific value of LME and of its relevance to IOC programme the **Executive Council strongly encouraged** that efforts be made, with the support of the Member States concerned, to establishing close cooperation between LME projects and the relevant IOC Regional Subsidiary Bodies.

4.2 OCEAN SERVICES

4.2.1 Ocean Data Policy

139 Dr David Pugh (UK), First Vice-Chair of the IOC, introduced this Agenda item in his capacity as Chairperson of the *ad hoc* Working Group on Oceanographic Data Exchange Policy. He referred to Document INF-1144, *Meeting of the* ad hoc *Working Group on Oceanographic Data Exchange Policy.*

140 Dr Pugh recalled that Resolution XX-11 of the 20th Session of the IOC Assembly instructed the IOC Executive Secretary to establish an *ad hoc* Working Group on Oceanographic Data Exchange Policy 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*". The Working Group was composed of 17 experts, including one co-Chair of JCOMM, the IODE Chair, a Representative of WMO, a Representative of the European Commission, a Representative of CODATA, the Chairperson of the ICSU Panel on WDCs, as well as Experts from IOC Member States. The Group met at UNESCO Headquarters, Paris, between 15 and 17 May 2000.

141 Dr Pugh explained that the role of the Group had been to assist the Governing Bodies of the IOC to decide on a Data Policy. This had been done in three ways. First, information on data policies from a wide range of organizations had been collected and included in the Report, together with information on existing statements of IOC data policies. Secondly, following an open discussion on relevant data issues, Dr Pugh stated that a short draft policy statement had been prepared. This policy statement begins with an overarching expression of the fundamental principle of free and unrestricted sharing of ocean data as expressed in Recommendation IODE-XIV.6 (1992). It contains eight paragraphs, in part based on WMO Resolution 40 (Cg-XII) and WMO Resolution 25 (Cg-XIII) which deal with the exchange of meteorological and hydrological data respectively under the auspices of the WMO. Dr Pugh reported that these paragraphs provide

for free and unrestricted exchange of data in support of the protection of life and property; to sustain programmes and projects of the IOC; and for research and educational communities. Three paragraphs, drawn from the WMO resolutions, which enable Member States to place restrictions on the re-export of data for commercial purposes, are contained in square brackets, because it was not within the competence of the *ad hoc* Group to judge whether they should be included as part of an IOC policy. Two final paragraphs emphasize the importance of long-term data preservation and management through IODE, and the necessity of enhancing the capacity in developing countries to participate and benefit fully from the exchange of ocean data and products. Finally, the group had tried to put a sharp focus on the dichotomy of opinion concerning the re-export of data for commercial purposes. Proposing a solution to this issue was beyond the competence of the *ad hoc* Group of Experts. Nevertheless the Group hoped that their work would help Member States move towards an agreed policy, through negotiations.

142 **The Executive Council congratulated** the Working Group with having produced an excellent reference document on IOC's as well as other organizations' policies on ocean data exchange.

143 Many delegates expressed their strong support to the existing IOC/IODE Policy Statement on Ocean Data Management for Global Science Programmes, the basis of which is free exchange of, and open access to data. Some Delegates noted that the principles included in this statement were those which had been used with considerable success since the IOC's establishment in 1960, and emphasized that it had been instrumental to the development of the IODE system which had brought substantial benefits to all, especially to developing countries. Some delegates stated that any change to this statement might have detrimental consequences.

144 Some delegations recognized that economic realities were forcing data collectors and compilers to consider partial recovery of public investments through commercialization of data, protecting databases through copyright, or by imposing restrictions on free access to data. In this regard special reference was made to coastal and other data collected in EEZs. It was observed that such restrictions would affect GOOS and ICAM which are dependent on access to data from the coastal zone. Another identified problem was the commercialization of products based on data made freely accessible by the public sector of developing countries through international programmes.

145 The Representative of ICSU strongly called on IOC not to modify its current data policy. As the guardian of the World Data Centre system, ICSU warned about three major concerns related to commercialization: (i) the development of significant gaps in global data sets; (ii) a commercially driven system will impose a cost for data to the scientific community; and (iii) data that cannot be published or re-exported cannot be used as the basis for scientific conclusions or public policy. He pointed out that many ICSU Partner programmes such as SCOR, GOOS, IGBP, etc., now have data policies that are based on free and open access to data.

146 The Representative of WMO stressed that the development of an IOC data policy is an issue of major importance to WMO. He pointed out that WMO Resolution 40 (Cg-XII) dealing with the international exchange of meteorological and related data and products, and Resolution 25 (Cg-XIII) covering hydrological data and products, were arrived at after long and difficult negotiations. He underlined that they allowed WMO to retain the fundamental principle of free and unrestricted exchange of meteorological data and products, and to expand the quantity of data and products.

147 The Representative of the Organization of African Unity informed the Council of the views of the OAU Member States regarding the possible commercialization of oceanographic data collected in the EEZ of African States. He recalled that, in principle, the commercialization of oceanographic data is in contradiction with the UNESCO Constitution, which is also endorsed by IOC.

148 **The Executive Council recalled and strongly endorsed** the statement "*Full and open sharing of a wide spectrum of global international data sets for all ocean programmes is a fundamental objective"* as included in the Draft Statement on Data Management Policy for Global Ocean Programmes (Annex to Recommendation IODE-XIV.6).

149 **The Executive Council noted** that the increased collaboration between IOC and WMO through bodies such as JCOMM called for compatibility between the data policies. In this regard reference was made to Annex 1 to Resolution 40 (Cg-XII) of which the purpose is to '*identify a minimum set of data and products which are essential to support WMO Programmes and which Members shall exchange without charge and with no conditions on use*.' It was observed that these include '*all available* in situ *observations from the marine environment'*.

150 **The Executive Council requested** that IOC Subsidiary, Technical and Regional Bodies and programmes on which the IOC data policy might have an impact, should review and assess the implications of the possible modifications of the policy and be invited to participate in the process of policy formulation.

151 **The Executive Council expressed its determination** to work towards the consensual formulation of a data policy that would be approved unanimously.

152 **The Executive Council thanked** the *ad hoc* Working Group for its accomplishments but **concluded** that this matter will now need the attention of an Intergovernmental Working Group, composed of representatives from Member States of the Executive Council.

153 **The Executive Council decided** to establish an intersessional intergovernmental Working Group on IOC Oceanographic Data Exchange Policy, with the purpose of drafting a resolution that defines the way forward on this issue and that can count on the unanimous support of the Council. The Group shall be open to participation to all Member States of the Executive Council. **The Executive Council elected** Dr A. McEwan as Chairperson of this Group.

154 **The Executive Council called upon** the working group to investigate into the legal aspects of an IOC data policy to determine whether the policy would have a legally binding or recommending character. It was recommended to give special attention to UNCLOS and the UNFCCC in this regard.

155 It was observed that the distinction between 'data' and 'products' is difficult to establish and accordingly, **the Executive Council called upon** the group to provide a clear definition of the data which would be required to be exchanged so as to avoid ambiguity which might effect the economic and sovereign interests of the nations providing the data.

156 **The Executive Council adopted** Resolution EC-XXXIII.4.

4.2.2 Disaster Preparedness: Tsunami and Storm Surges

157 The International Decade for Natural Disaster Reduction (IDNDR) came to an end on 31 December 1999. During the years of the Decade, IOC responded to IDNDR objectives in different ways, especially in the areas of tsunamis, storm surges and "El Niño" mitigation, research and preparedness, by creating and improving early warning systems, implementing capacity-building efforts and providing expert knowledge.

158 **The Executive Council made** a thorough review of the IOC activities in disaster preparedness.

159 (i) The item was introduced by the Director of the International Strategy on Disaster Reduction (ISDR), Dr Philippe Boullé, who summed up the lessons learned from IDNDR, described the follow-up to the Decade, and identified ways for future cooperation with IOC.

160 IDNDR clearly showed that disasters have become societal problems, that costs of disasters are becoming unbearable in human and material terms, that Member States can manage risk from natural hazards, that long-term action is needed, and that concrete actions for prevention should be developed.

161 The UN General Assembly took a decision in 1999 regarding the post IDNDR strategy in disaster reduction, and the new UN mechanisms established to coordinate the efforts of international agencies and Member States in enabling communities to become resilient to natural hazards. The International Strategy on Disaster Reduction (ISDR) was formulated and the Inter-Agency Secretariat was established.

162 Dr Boullé identified a number of areas of common interest to IOC and ISDR, where the possibility of future cooperation can be explored, among them cooperation in public awareness and transfer of knowledge to developing countries, in the reduction of the impact of "El Niño", and in promoting early warnings as a key element for strengthening disaster reduction capacity.

163 **The Executive Council took note** of the establishment of the International Strategy for Disaster Reduction, as a global programme of the United Nations for disaster prevention. **The Executive Council urged** the Secretariat of the ISDR to ensure that scientific and technical issues, including those that relate to oceans, are given the priority they deserve in global and regional disaster prevention and reduction activities. **The Executive Council looked forward** to increased cooperation between IOC and ISDR **and invited** the Executive Secretary to consider concrete actions for extending this cooperation.

164 (ii) Dr F. Schindele (France), Chairperson ICG/ITSU, introduced for adoption the Summary Report and Recommendations of the 17th Session of the IOC International Coordination Group for the Tsunami Warning System in the Pacific which was held in Seoul, Republic of Korea, from 4-7 October 1999 under the auspices of the Korean Meteorological Administration.

165 He focused the Council's attention on the Recommendations made at ITSU-XVII, namely, (i) on the formation of two *ad hoc* Working Groups: one to consider and modify, if necessary, the responsibilities of Pacific Tsunami Warning Centre (PTWC), another on the procedures and criteria for issuing warnings, watches, and cancellations; (ii) on the development of the basic Pacific-wide Tsunami Catalogue and Database on CD-ROM; and (iii) on the ICG/ITSU Programme and Budget for 2000-2001.

166 Dr Schindele emphasized the importance of the International Tsunami Information Centre (ITIC) in developing disaster prevention and preparedness activities. ITIC activities are key aids in reducing the need for disaster relief, and in disseminating information on the progress of the IOC Tsunami Programme. He pointed out that during recent years, due to the limited resources, there was a decline in the ITIC activities. He thanked the Government of Chile for nominating the Associate Director of ITIC, Dr Rodrigo Nuñez, and for supporting his activities.

167 Dr Schindele gave a few examples of close cooperation between the ICG/ITSU and its scientific partner, the IUGG Tsunami Commission, referring to the Tsunami Inundation Modelling Exchange (TIME) project and the jointly organized workshops.

168 He concluded by drawing the attention of the Council to the problems the programme faces, which include a low level of funding from the IOC Regular Programme; very limited contributions by IOC Member States to the Trust Fund for ITSU, and the need for continuity in secretarial support when the present Technical Secretary of the programme ends his consultant work after implementing ITSU-XVIII and other related activities in 2001.

169 That presentation was complemented by a talk given by Dr E. Bernard (USA), the Past Chairperson of the IUGG Tsunami Commission. He referred to IOC publication (IOC/INF-1124, *ITSU Master Plan*) and presented a view of the future development of the tsunami programme components: assessment, preparedness and warning. He emphasized that the plan is to expand and implement these components in all tsunami-threatened areas around the World - including the Caribbean, Mediterranean and the Indian Ocean. Implementation may be achieved through a set of numerical models of tsunami behaviour to be used by global scientists and emergency managers alike to identify tsunami inundation areas throughout the world. This network would enable scientists and planners access the latest assessment technology, and emergency management material to avoid duplication of effort. These tools would include other hazards that affect these same communities (such as storm surges or El Niño events) so that the community takes an "all hazards" approach to hazard mitigation. The futuristic warning system would supply tsunami wave forecasts based on data from network of deep ocean sensors supplied to forecast models in real time. He called this vision - TROIKA, a three-part programme to reduce tsunami hazards. He expressed belief that the IOC's endorsement of TROIKA will enable Member States to form partnerships at local, regional, hemispherical and global levels with support from governments, private organizations, and philanthropists.

170 In discussion several Member States, Australia, Japan, Peru, Republic of Korea, Russian Federation, reported on their national activities related to the tsunami programme.

171 **The Executive Council thanked** the Republic of Korea for inviting ITSU-XVII and Colombia for inviting IOC to have ITSU-XVIII in Cartagena in the fall of 2001. **The Executive Council requested** the Executive Secretary to take all necessary measures for the successful preparation and implementation of the Session.

172 **The Executive Council acknowledged** the support of Chile on its smooth running of the ITIC activities.

173 **The Executive Council noted** the danger of potential tsunamis in the Intra-American Sea and along the Indian Ocean coastline of Indonesia and Australia, **urged** Member States concerned to take necessary preventive and preparedness measures, **and asked** the IOC Executive Secretary to organize coordination of, and report on these efforts.

174 **The Executive Council adopted** Resolution EC-XXXIII.5.

175 (iii) Dr A.E. Muthunayagam (India), Chairperson IOCINDIO, presented the progress of the project on "Storm Surges Disaster Reduction in the Northern Part of the Indian Ocean". This project is sponsored by IOC, WMO and the International Hydrological Programme (IHP) of UNESCO, and was adopted for implementation in 1998. He recalled that the aim of the project is to develop capability and infrastructure to provide storm surge and disaster warning to save lives, reduce damage, and encourage sustainable development in coastal regions.

176 Dr Muthunayagam then reported on actions taken after the 20th Session of the IOC Assembly in 1999.

177 IOC and WMO convened a regional meeting during 22-26 October 1999 at the Indian Institute of Technology at New Delhi. This regional meeting was hosted by the Department of Ocean Development of India. Representatives of Bangladesh, India, the Islamic Republic of Iran, Maldives, Mauritius, Myanmar, Pakistan and Sri Lanka participated in the meeting, which adopted the proposal and approved the plan of action for the pre-project period.

178 Mr B.N. Krishnamurthy from India was nominated as the Pre-Project Manager.

179 The Pre-Project Manager approached the World Bank, UNDP, ADB, DFID, EC and representatives of some donor countries located in India. While these agencies appreciated the proposal, they wanted government approvals from the respective Member States, and their financial assistance. Based on the details of funds required that were available in the project proposal, the Pre-Project Manager prepared documents to facilitate getting government approvals and financial assistance. Member States are yet to inform the Pre-Project Manager of the actions they have taken, one of the status of government approval of commitments, or of external assistance from funding agencies.

180 The IOCINDIO, at its third session at Tehran during February 2000, adopted the proposal and steps for project implementation. The 27th Session of WMO/ESCAP Panel on Tropical Cyclones endorsed the project proposal and urged Member States to take steps to get government approvals and financial assistance. JCOMM expressed overall support for the Storm Surge Project and agreed to make JCOMM experts available during project implementation.

181 A draft brochure on the project was prepared and submitted to IOC for publication.

182 Dr Muthunayagam finally pointed out the importance of the project, which is a challenging and important response to UNCED (1992) *Agenda 21* recommendations.

183 The delegates from Australia, Canada, Colombia, France, Nigeria, Peru, Philippines, Republic of Korea, the Russian Federation, WMO, JCOMM and IOI made interventions and supported the project.

184 The Delegate of Nigeria made specific reference to the tropical cyclones and associated floods that devastated the southern African coastline in March 2000, and urged the networking and synergising of all Warning Systems, as appropriate, into a "Global Alert Facility for Ocean Related Natural Disasters and Hazards" to forewarn governments, well in advance.

185 Some delegates hoped that Member States of the region would take necessary steps at the ministerial level to fund the project.

186 **The Executive Council thanked** the Chairperson of IOCINDIO for an interesting presentation, **acknowledged** with satisfaction the progress achieved **and adopted** Resolution EC-XXXIII.6.

187 The Representative of WMO reported that his organization supported the development of the project proposal on "Storm Surges for the Northern Part of the Indian Ocean" at the 13th WMO Congress and following sessions of WMO Executive Council. The 52nd Session of the WMO Executive Council in May 2000 endorsed an approach to International Funding Agencies by IOC/WMO/UNESCO-IHP by 31 July 2000, in accordance with the plan of action for the project. WMO is prepared to take coordinating role in the project in close collaboration with IOCINDIO, in particular at the stage of operational implementation of the project.

4.2.3 General Bathymetric Chart of the Oceans (GEBCO)

188 This Agenda item was introduced by Sir Anthony Laughton, Chairperson of the Joint IOC-IHO Guiding Committee for GEBCO. In his introduction he gave an historical overview, and made the Council aware of the present status and future plans for GEBCO, which is now being fully digitized.

189 Dr Laughton stated that during recent years, pressures have been building up from the oceanographic and other communities for a more accurate portrayal of the ocean floor. Oceanographers recognize the importance of bathymetry for modelling circulation, tides, tsunami propagation, fisheries resources, pollutant transport, and ocean basin evolution. SCOR Working Group 107 is defining priorities in this respect. At the same time there are legal and living resource requirements for improved bathymetry. Many users want to receive digital data.

190 In the GEBCO Digital Atlas, version 3 (2001) a gridded database is being prepared on a 2.5’ grid, and will include also data on continental margins so as to provide links with terrestrial grids.

191 In 2003, the Centenary of GEBCO will be celebrated by a conference and special events in Monaco.

192 GEBCO faces funding difficulties to meet the demand of organizing its work. There are only limited travel funds for coordination, and no resources for printing the sixth edition or supporting staff. Sir Anthony presented possible routes of GEBCO for the future, including commercialization, patronage or sponsorship, support for oceanographic programmes, an educational GDA, and GEBCO Centenary fellowships.

193 **The Executive Council applauded** Sir Anthony for his presentation **and expressed** its strong support for GEBCO. **The Executive Council appreciated** the help of many volunteers in GEBCO implementation and felt that more funds should be available to the programme. The Delegate of Mexico proposed the Participation Programme be used for this purpose.

194 Several delegates reported on the progress made by their countries in the production of International Bathymetric Charts (IBCs), the data of which are also incorporated in GEBCO. The Delegates of China and Nigeria underlined the importance of GEBCO data for the delimitation of

the continental shelf under UNCLOS (Art. 76) and the need for capacity building in developing countries. The Delegates of Canada, Russian Federation and USA did not favour the idea brought forward by the GEBCO Chairperson to commercialize GEBCO and recommended finding ways to avoid this process. The Delegate of Chile suggested establishing a new bathymetric project in the south-eastern Pacific, an initiative supported by Peru. **The Executive Council warmly appreciated** the donation by the Delegate of Germany of the second sheet of the International Bathymetric Chart of the Western Indian Ocean (IBCWIO), which was just printed, by his agency as a contribution to GEBCO.

195 The Delegate of Argentina expressed the opportunity to optimize the databases of GEBCO, with the activity of the Member States are making or will make to improve the delimitation of the external border of the continental margin in accordance with the UNCLOS guidelines.

196 The President of the International Hydrographic Organization (IHO) informed the Council about progress made in the preparation of the GEBCO Centenary celebration in April 2003.

197 **The Executive Council adopted** Resolution EC-XXXIII.7.

4.3 OPERATIONAL OBSERVING SYSTEM

4.3.1 Global Ocean Observing System (GOOS) and Related Matters

198 This item was introduced by the Director of the GOOS Project Office (GPO), Dr Colin Summerhayes.

199 Dr Summerhayes introduced delegates to the GOOS structure (shown in Summary Report of I-GOOS-IV, Annex V), which comprises four major functions: (i) scientific design and liaison; (ii) implementation oversight; (iii) liaison and integration; and (iv) outreach and infrastructure. Scientific design is focussed on the four GOOS planning modules: climate (through OOPC); coastal; living marine resources; and health of the ocean. Implementation oversight takes place in two ways: (i) at the global level, through JCOMM and its subsidiary bodies, and (ii) at the regional level, through the newly formed GOOS regional bodies. Liaison and Integration covers communication and coordination between GOOS and the numerous other groups with interests in observations at the global level, including (i) other global observing systems (like GCOS and GTOS); (ii) research programmes (like IGBP and WCRP); and (iii) conventions (like the UNFCCC); and includes partnerships (like those with the space agencies, academic institutions, and regional organizations (like ICES and PICES). Finally, Outreach and Infrastructure covers publication; capacity building; and the activities of the regional programme office in Perth, Australia.

200 Dr Summerhayes noted that GOOS is already operating today as the GOOS Initial Observing System (GOOS-IOS), which brings existing systems together prior to integration. It comprises measurements from ships, buoys, floats, coastal stations and satellites, and continues to evolve. New elements added at the third session of the GOOS Steering Committee (GSC) in Paris on 10-12 May 2000 include: (i) the joint Global Observing Systems Information Centre in Delaware; and (ii) the California Cooperative Oceanic Fisheries Investigations (CalCOFI). It is proposed to add the major national operational centres that use operational oceanography in weather and climate forecasting, following agreement by the OOPC on the names of the centres to be approached.

201 GOOS is also being implemented through pilot projects. In the equatorial Atlantic the Pilot Research Array (of buoys) in the Tropical Atlantic (PIRATA) continues to make good progress. A meeting was held in Casablanca in March 2000 to expand African membership in PIRATA. The PIRATA steering group met in Natal, Brazil, in April 2000, to begin exploring the conversion of PIRATA from a research array to an operational system. The other major pilot project is GODAE, which was discussed under Agenda Item 4.1.1.

202 In addition to these international elements, many nations are now contributing substantial parts of their national observing systems to GOOS. In several cases the commitments made at the Initial GOOS Commitments Meeting in Paris in July 1999 were insufficiently specified. GOOS is now developing a mechanism for determining the specifics of what was committed. In response to a question from the Delegate of Germany, Dr Summerhayes reported that the report of that meeting was completed and would be distributed shortly.

203 Vandalism of buoys continues to be a hindrance to implementation, most recently in the Indian Ocean. In accordance with Resolution EC-XXXI.4, on Vandalism of Oceanographic Equipment, several actions have been carried out. In September 1999 the UN General Assembly endorsed IOC Resolution EC-XXXI.4, in paragraph 22 of Resolution A/res/54/31, under Agenda Item 40 (a) Oceans and the Law of the Sea. Brochures in several languages about the TAO, TRITON and PIRATA programmes have been widely distributed for the attention of fishermen. Japan noted that its distribution of a TRITON brochure led to a reduction in vandalism. The Chairperson of PIRATA delivered a paper on this problem to the International Fish Aggregation Device Conference in Martinique in October 1999. WMO wrote to the IHO to seek their help in promulgating information on ocean data buoys through notices to mariners and navigational warning messages.

204 Dr Summerhayes emphasized that national and regional efforts are the life-blood of GOOS and it is essential that IOC fosters their development. There are now regional GOOS bodies for most of the key regions where the interests of many Member States overlap. They include: Black SeaGOOS; PacificGOOS, covering S.W. Pacific island States; MedGOOS; IOCARIBE-GOOS; ICES-GOOS for the North Atlantic (developed in accordance with Resolution XX-9, and which will hold its first meeting in September); GOOS-AFRICA; NEAR-GOOS; and EuroGOOS. Within EuroGOOS, the Baltic Operational Oceanographic System (BOOS) is an example of putting Coastal GOOS into practice. Member States can access the Baltic GOOS Plan through the EuroGOOS website.

205 IOC has opened a Project Office[2] in Perth, Australia (called the IOC Perth Programme Office), with the aid of Australian funding which, *inter alia*, will assist in the development of an Indian Ocean GOOS.

206 Papers on GOOS were given at a number of IOC regional meetings including IOCINDIO-III and IOCEA-V.

207 Recent activities designed to promote GOOS in Africa include the MedGOOS meeting in Rabat in November 1999, and the PIRATA meeting in Casablanca in March 2000. A paper on GOOS was given at the IOCEA meeting in Dakar to encourage further GOOS development in Africa. The Chairperson of GOOS-AFRICA attended the IOCEA and Rabat meetings to stimulate regional GOOS developments. In accordance with Assembly Resolution XX-20, discussions are

[2] Term in accord with the definition given in paragraph 369.

underway regarding the formulation of proposals for pilot projects to implement the recommendations of PACSICOM.

208 Regional developments require capacity building. To assist this process, the GOOS Capacity Building Panel has been re-designed and is now under the leadership of Geoff Holland, former IOC Chair. It has developed a strategy and implementation plan and will soon develop a set of initial actions for the future.

209 The Living Marine Resources, Health of the Ocean and Coastal Seas Panels will finalize their strategies for implementation by October this year. The three strategies will be published to help advise Member States on the implementation of GOOS in coastal seas. These three panels will then come together in an integrated Coastal GOOS Panel, whose initial task will be to integrate the three design plans to consolidate GOOS implementation in coastal seas.

210 Several stakeholders' meetings have been held to get user input to the design process. To aid in the development of the integrated Coastal GOOS Panel, which will meet in the Caribbean in November 2000, a Users' Forum will be held in conjunction with the Panel meeting. The Forum will be attended by representatives of all regional and national GOOS bodies, who will be expected to act as representatives of their many user communities. It will provide a mechanism for channelling users' views to the new Panel, and for informing users about the Panel's activities and plans.

211 As approved in Resolution EC-XXXI.8, IOC has been working to develop consensus between the space agencies and the *in situ* global observing community through the Integrated Global Observing Strategy Partnership (IGOS-P). Because GOOS is well advanced, the Partners decided to start with an *Ocean Theme*, within which specific demonstration projects include GODAE and Argo. The strategy for implementation of the *Oceans Theme* is spelled out in document IOC/INF-1134, and has been endorsed by the GOOS Steering Committee (May, 2000), and by the fifth IGOS-P meeting in Geneva (7 June 2000). It highlights the need for specific kinds of observations, especially from space, but also from the oceans, and stresses the need for continuity of key satellite and *in situ* observations. It will be used by the space agencies as part of the argument for continuity of observations of the ocean from space.

212 In the fourth meeting of the IGOS-P (in Stockholm) IOC did accept to take the lead of the *in situ* component of the *Ocean Theme* through the incremental implementation of GOOS This excellent step brings the space agencies into GOOS as full partners, along with their commitments, which therefore considerably expand the GOOS Initial Observing System.

213 The **Executive Council noted** and **endorsed** the *Ocean Theme* document, especially the recommendations set out in its executive summary, and **urged** the space agencies to commit to ocean colour missions beyond 2005. **The Executive Council also noted** and **endorsed** the plans of CNES, NASA, NOAA and EUMETSAT to ensure the continuity of precision altimetry observations through the Jason programme; such observations are essential for building long-time series of ocean variability. The Delegates of USA and Canada noted that the *Ocean Theme* document focuses mainly on measurements from space, and asked that the document be edited to ensure that it includes a comprehensive statement of *in situ* requirements.

214 Dr Summerhayes noted that international coordination in support of GOOS is now being aided by the Partnership for Observation of the Global Ocean (POGO), which held its first full meeting in San Diego in December 1999 (Document IOC/INF-1139). POGO provides a forum in

which the directors of some of the world's major oceanographic institutions that are capable of global observations can consider how they may contribute to GOOS. Initial priorities of POGO are Argo, time-series stations, data management, and capacity building.

215 Dr Summerhayes concluded by referring to the budget and staffing of the GOOS Project Office. More than half of the financial resources for the international meetings needed to plan and coordinate the development and implementation of GOOS come from Member States *via* grants for specific earmarked activities. The GPO is most grateful to the countries that supplied funds this year: Australia, France, Holland, Italy, Japan, Morocco, Sweden, the UK, and the USA. **The Executive Council noted** that if GOOS is to develop further, there is a need for its better integration in the IOC framework both at global and the regional levels, as well as for more adequate financial support by Member States.

216 GOOS is a very large programme, and requires a large staff. Demands on the staff continue to increase, not least because of the growing regional development of GOOS. Some of the pressure has been alleviated by hiring Dr Maria Hood on contract with the support of money from NOAA and the UK Met Office, to work on GOOS data and information management in a post shared with the IODE. In addition, with the aid of Australia, IOC has been able to provide a staff post in the Indian Ocean, occupied by Mr Bill Erb. IOC is grateful to Japan for agreeing to replace Ms Rimi Nakano in the GPO. However, we have lost Ms Janice Trotte, who had been seconded to the GPO by Brazil for 3 years. **The Executive Council was most grateful** to Australia, Brazil, Japan, UK, and the USA for the staff they support or have supported in the GPO. To help GOOS develop in the regions, **the Executive Council invited** Member States to provide additional resources singly or together to pay for another consultant staff post either at Headquarters or in a key region.

217 **The Executive Council expressed** its satisfaction with the hard work of the GPO and the GSC and its advisory bodies in taking GOOS forward. GOOS is the IOC's largest and most complex activity, worthy of the designation as a flagship.

218 Some delegates observed that GOOS appears to have a large and complex structure that is difficult for all governments to understand and there is a danger of duplication and overlapping. Tunisia reported that it had experienced some confusion due to the apparent overlapping responsibilities of IOC and MedGOOS. Other delegations observed that such complexity was quite natural in such a large and ambitious undertaking. The Delegate from USA observed that implementation of GOOS was complex not only at the international level, but also at the national level, where responsibilities for oceans were commonly spread among different Government Departments. This difficulty was not something that could easily be solved by the IOC working in a top-down manner. Any consideration of the structure should be made very carefully so as not to lose the support of the large community of scientists who had built much of it from the bottom up. This view was echoed by several delegations.

219 While recognizing that GOOS is inevitably a large and complex undertaking, as is evident from its present structure, **the Executive Council asked** the Secretariat to prepare a factual statement of the structure, mandates and *modus operandi* of GOOS to be made available at the next IOC Assembly, as a basis for consideration of whether there was any need for revision and streamlining of the structure to make it more functional.

220 **The Executive Council agreed** that the development of a coastal observing system was of vital importance especially to enable developing countries to participate in and benefit from

GOOS, and **asked** that design for its implementation be made available in the form of the planned Handbook as soon as possible to Member States. Aside from making the design available, **the Executive Council agreed** that more effort is required *via* GOOS/TEMA to build capacity in developing countries, and **looked forward** to seeing the plans of the GOOS Capacity Building Panel.

221 The Delegate of Morocco advised that any GOOS-AFRICA meeting planned by the GOOS Capacity Building Panel should be held before the Partnership Conference that is planned for 2001.

222 The Delegate of Germany noted that neither reference had been made to important activities such as the SeaNet programme of the European Commission (EC) in the North Sea, nor to cooperation with environmental commissions or conventions. Dr Summerhayes explained that SeaNet is regarded as operational and will, in due course, be included within GOOS. He reported that Baltic-GOOS is interacting with the Helsinki Commission (HELCOM), and EuroGOOS is interacting with the Oslo-Paris Commission (OSPARCOM).

223 Several delegates reported on their inputs to the GOOS Programme.

224 The Delegate of Cuba noted that his country was pleased to be able to host the next meeting of the Advisory Group for IOCARIBE-GOOS, which would take place in Havana at the end of November, and which would help to shape the development of GOOS in the Caribbean.

225 Japan reiterated its intention to provide a replacement in July 2000 for Ms Nakano in the GPO, and noted that it had hosted the last NEAR-GOOS Coordinating Committee meeting, as well as the NEAR-GOOS data and information management training course. It is contributing to GOOS through research, through participation in NEAR-GOOS and through deploying TRITON buoys in the Tropical Atmosphere Ocean (TAO) array in the equatorial Pacific.

226 The Republic of Korea also supports NEAR-GOOS and will host the next meeting of the NEAR-GOOS Coordinating Committee.

227 China is investing 80 million yuan (approximate 10 Million US dollars) in a coastal observing system that will contribute to coastal GOOS in the NEAR-GOOS region.

228 The Russian Federation stressed the importance of regional GOOS developments and expressed its interest on EuroGOOS, Baltic-GOOS and Arctic-GOOS.

229 The Representative of SCOR noted that the scientific community has come to appreciate GOOS and the need for the development of operational oceanography, largely owing to the efforts of the GPO and the GSC and its advisory groups in winning the trust of the scientific community. SCOR stands ready to provide GOOS with scientific advice.

230 WMO stated that it would continue to play an active role in GOOS and provide support to GOOS activities. WMO recognizes a need for closer cooperation between oceanographic satellite operators, which could be met through an existing mechanism like the Coordination Group for Meteorological Satellites (CGMS), if IOC could join WMO as a member. Such a change might require an extension of the Terms of Reference of the CGMS. **The Executive Council asked** the Secretariat to consider this possibility and report to the next Assembly.

4.3.2 Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)

231 **(i) JCOMM**. This Agenda item was introduced by Professor Dieter Kohnke, interim Co-president of JCOMM, who reminded delegates that JCOMM had been formed in response to IOC Resolution XX-12, to integrate the former WMO Commission for Marine Meteorology (CMM) and the former IOC-WMO Technical Committee on Integrated Global Ocean Services System (IGOSS). The Resolution instructed the IOC Executive Secretary to establish procedures and a timetable for the transition to JCOMM, the first session of which will be in Akureyri, Iceland, from 19-29 June 2001.

232 Since the 20th session of the IOC Assembly, two so-called Transition Meetings for JCOMM took place, the first in St. Petersburg, Russian Federation (July 1999) and the second in Paris, France (June 2000). These two meetings have drafted the JCOMM structure, a JCOMM work plan, the work programme until the first session of JCOMM, and the annotated agenda for JCOMM-1. Reports of the two meetings were made available to the members of the Executive Council.

233 The St. Petersburg meeting began the process in which oceanography and marine meteorology will transit from the existing largely unconnected set of operational observing programmes and data management and service activities, to a fully coordinated and integrated system. This transition process will likely evolve the tasks of existing mechanisms towards an agreed new structure, while also ensuring the preservation of existing essential activities of CMM and IGOSS, particularly in marine services and data provision.

234 It was decided that two interim co-presidents should take responsibility for the transition process, and that they should be the past chairs of CMM (Johannes Guddal) and IGOSS (Dieter Kohnke).

235 Prof. Kohnke reported that the Transition Meetings had agreed that the JCOMM ideal of implementing an operational oceanographic services system would best be met through four major programme areas: observations, data management, products and services, and capacity building. These should be overseen by a JCOMM Management Committee. The Committee would include the co-presidents, the coordinators of the four programme areas, and representatives of relevant scientific design and planning bodies.

236 The second JCOMM Transition Meeting decided to set up a small group to draft a strategic plan for capacity building in JCOMM, which is to be submitted to the first session of JCOMM. The strategy should include a prioritization of requirements and the identification of resources to meet them. The strategy will be developed in close cooperation with GOOS, whose principles for capacity building have emerged from the IOC's TEMA Programme.

237 Finally Prof. Kohnke mentioned several workshops and experts' meetings held in the inter-sessional period and the expert meeting on sea ice.

238 **The Executive Council approved** the formation of the JCOMM Interim Management Committee that was set up at the JCOMM-TRANS meeting in St. Petersburg, and the recommended procedure regarding the nomination of the interim co-presidents of JCOMM, and co-chairs of the JCOMM Interim Management Committee.

239 Prof. Kohnke noted that DBCP, SOOP and Argo are providing a number of similar services that can be integrated to a large extent. Integration is facilitated by the fact that DBCP and SOOP are presently coordinated by the same IOC staff member in Toulouse, France. Argo will soon have a coordinator who will also work in Toulouse under the supervision of the same person. In the same spirit that led to the merging of CMM and IGOSS, it was proposed to integrate those activities into one entity, which might be called something like the JCOMM Operations Centre (JCOMMOPS). JCOMMOPS will include services that relate to *in situ* measurements in relation to physical oceanography and marine meteorology, and that will require coordination at the international level for operational purposes. JCOMMOPS will run a website that will deliver services plus links to JCOMM facilities like the JCOMM Electronic Products Bulletin.

240 Dr Summerhayes, IOC Secretariat representative to the JCOMM Transition Committee, reminded delegates that in accordance with Resolution XX-12, WMO and IOC had advised their Member States and Members in November 1999 about the formation of JCOMM, and asked them to formally nominate technical experts to serve as members of it. Some 200 nominations are now in hand.

241 He noted that, as required by Resolution XX-12, the Secretariats of IOC and WMO are now developing a common set of rules and procedures for the conduct and support of JCOMM, which will give equal weight to both organizations, and which will be presented to the coming sessions of the IOC Assembly and WMO Congress for approval. Because such approval will not be available before JCOMM-1, and because WMO will be responsible for funding the meeting, preparation of pre-session documentation and immediate follow-up, as well as translation into six languages including Arabic and Chinese in addition to the IOC languages, it was proposed that the meeting should be conducted according to the WMO rules relating to technical commissions.

242 **The Executive Council approved** this proposal, **and urged** the Secretariats to conclude these developments prior to the next meetings of the IOC and WMO governing bodies in 2001.

243 **The Executive Council agreed** that JCOMM is a major step forward in inter-agency coordination and in oceanography and marine meteorology. **The Executive Council endorsed** the progress made to date, including the draft structure and the annotated Agenda for JCOMM-1 as presented in the report of the second JCOMM Transition Meeting. In addition, **The Executive Council endorsed** the progress towards an operational centre, including an Argo Information Centre in Toulouse, **and urged** Member States to provide the additional support required for Argo coordination there.

244 **The Executive Council warmly congratulated** all those involved in the development of JCOMM on progress to date. The efforts of Prof. Kohnke, Dr Guddal, and Dr Dexter of the WMO Secretariat were singled out for special praise.

245 The Delegate of Portugal noted that the new requirement for greater coordination between meteorology and oceanography at the national level means that the functions and structures at the national level may no longer be adequate to present needs. IOC may assist Member States, at their request, by providing advice on required institutional adjustments. This is an issue that also affects UNESCO structures at national level, and needs examination in the future. The IOC Executive Secretary stressed that the creation of JCOMM has changed the culture of two communities of practitioners in meteorology and oceanography which opens a very positive opportunity to examine our supporting structures at the national level. JCOMM is an example for the UN system

and we are likely to see similar links develop to unite other UN agencies in joint operational structures.

246 The Delegate of China suggested that WMO be consulted with regard to the possibility of using the term IOC-WMO JCOMM by the IOC Governing Bodies and WMO-IOC JCOMM by the WMO Governing Bodies.

247 **(ii) Ship-of-Opportunity Programme (SOOP) and Data Buoy Cooperation Panel (DBCP).** Dr Summerhayes provided a brief report on progress with SOOP and DBCP.

248 The **SOOP**, originally a programme of IGOSS and now an integral part of the GOOS Initial Observing System, will in future be managed by the new body, JCOMM, through an integrated mechanism to include the existing SOOP-Implementation Panel.

249 As reported at the recent SOOP-Implementation Panel (SOOP-IP) meeting in March 2000, information about SOOP is available on the new SOOP website (http://www.brest.ird.fr/soopip). Some 14,000 XBT profiles were made during the first six months of 1999. The Equatorial and North Atlantic Ocean is well covered while the South Atlantic is under-sampled. The Indian Ocean is adequately sampled except in the south. The Pacific Ocean is relatively well sampled, except in the south; and the Southern Ocean is under-sampled.

250 SOOP-IP is implementing a major revision of the SOOP to make it complementary to the Argo float programme. With the advent of Argo floats the need for a widespread low density XBT network diminishes. Recognizing this development, it was planned that SOOP would gradually withdraw from low-density areal sampling and focus its efforts on high density XBT sampling along selected lines. The high density data will be useful aids to resolving eddies, and will provide the high quality, high resolution repeat data needed for observing changes in ocean circulation through time. The change is designed to optimize the upper ocean sampling system, and addresses the goals of both GOOS and CLIVAR.

251 Dr Summerhayes stated that there are resource implications. There has been a decrease in XBT deployments owing to increasing prices set against fixed or reducing budgets. This raises the question of the need for agencies and governments to establish funding programmes to maintain ocean observing systems operationally.

252 The **DBCP**, which held its last meeting in October 1999, continues to play a very active role in coordinating buoy programmes worldwide. In May 1999, a DBCP Internet forum (http://www-dbcp.cls.fr) was opened to facilitate debate on technical issues and to exchange information among buoy operators.

253 Like SOOP-IP, the DBCP is also an integral part of the GOOS Initial Observing System. The Panel will in future be coordinated through JCOMM. The new reporting procedures necessitate some minor changes to the DBCP's Terms of Reference, which have already been agreed by the WMO Executive Council.

254 Dr Summerhayes emphasized that like SOOP, DBCP also has a resource problem. At its last meeting, the DBCP noted with considerable concern the likely loss of important atmospheric pressure data from the Southern Ocean that would result from a reduced deployment of SVP Barometer drifters, in particular in the Southern Ocean, due to resource limitation in many countries. The DBCP recommended that the meteorological services concerned should consult

together and with other interested agencies, perhaps by way of the DBCP forum, with a view to finding a resolution of the problem.

255 During the discussion, the Delegate of Australia noted that barometric data from the Southern Ocean was essential for the calibration of satellite data relating to winds. The Delegate of USA regretted that budgetary constraints precluded the inclusion of more barometers.

256 **The Executive Council noted** and **endorsed** progress with and developments in SOOP and the DBCP, **noted** the resource implications, **and urged** Member States to fully support these and related ocean observing systems.

257 **The Executive Council approved** the new Terms of Reference for the DBCP and its Technical Coordinator **and adopted** Resolution EC-XXXIII.8.

4.3.3 Global Sea-Level Observing System (GLOSS)

258 Dr T. Aarup, Technical Secretary of the IOC Group of Experts on GLOSS, introduced this Agenda item.

259 The sixth meeting of the GLOSS Group of Experts (GGE) took place in Toulouse, France, in May 1999. A report of the meeting has been published (GOOS Report No. 71; http://ioc.unesco.org/goos/GLOSS-VI_rpt.pdf). A summary of actions stemming from the meeting, with notes on progress made since May 1999 on each action, can be found at the GLOSS Website. The GGE approved the formation of a Scientific Sub-Group (SSG) for GLOSS, the Chairperson and members of which have since been appointed. The items the SSG will address first include the need to obtain better information worldwide on extreme sea levels; the availability of air pressure data sets in many areas; and the requirements for bottom pressure measurements. Further topics at a later date will include a reassessment of the GLOSS/WOCE/CLIVAR sea level networks.

260 GLOSS training courses were held in Brazil from 30 August– 25 September 1999 and in Saudi Arabia from 15-20 April 2000. The latter course was co-sponsored by the Regional Organization for the Conservation of the Environment of the Red Sea & Gulf of Aden (PERSGA) and the Arab League of Education, Culture and Science Organization (ALECSO). A new training manual on tide gauge operations and data analysis has been drafted and will be published later this year.

261 A survey has been conducted by 'Service Hydrographique et Océanographique de la Marine', France, on behalf of the Permanent Service for Mean Sea-Level (PSMSL) and GLOSS on gauge sites with GPS. A further action from GGE is the production of an additional manual on methods for operating GPS at gauge sites.

262 **The Executive Council considered** the MedGLOSS sea-level pilot network in the Mediterranean and Black Seas, jointly coordinated by IOC and the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) as of high importance providing data for monitoring and forecasting of long-term sea-level change and for operational oceanography. **The Executive Council urged** all the countries bordering the Mediterranean and Black Seas to provide financial assistance to their national organizations participating in MedGLOSS for upgrading their sea-level measuring equipment to MedGLOSS standards, for

long-term maintenance and operation of the MedGLOSS monitoring stations and for historic data rescue. The formal active operation of the MedGLOSS pilot network will start on 1 October 2000.

263 The Technical Secretary for GLOSS noted with concern the decision of the International Hydrographic Organization (IHO) and the Canadian Marine Environmental Data Service (MEDS) to stop operating. He pointed out that the suggested replacement (*i.e.*, national authorities going their own way with regard to the provision of tidal constants) is not adequate, because the development of improved truly-global tide models for coastal areas (*e.g.*, for Coastal GOOS) depends on the availability and updating of the global tidal constants data set.

264 The Delegate of Canada agreed to bring this concern to the attention of the appropriate national authority. He also emphasized its support for GLOSS, and noted the importance of an appropriate placement of sea-level measuring stations in both the open ocean and coastal seas.

265 **The Executive Council was also concerned** with the poor situation with Arctic recording **and invited** all agencies involved with Arctic sea level interests to maintain Arctic measurements.

266 The Delegate of the United Kingdom noted with satisfaction that GLOSS responds to new technology developments. The delegate noted that GLOSS should benefit from increased collaboration with WMO's sea-level related programmes (storm surge warning programmes) under the JCOMM. Finally the delegate congratulated the GPO for having arranged the joint IOC-PERSGA-ALECSO Sea-Level Training Course, and noted the importance of this course, as until now there had only been limited GLOSS activities in that region.

267 The Delegate of the Russian Federation noted the importance of the GLOSS sea-level network for the climate and coastal modules of GOOS. He stressed the need for financial and technical support in order to upgrade and automate the Russian GLOSS sea-level stations.

268 The Chairperson of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA) appreciated GLOSS but noted that many of the GLOSS stations in the IOCEA countries are not functioning. The two Ghanaian sea-level stations in Tema and Takoradi Harbour as well as the station in Lagos, Nigeria, are not operating. IOCEA requested IOC to help to remedy this situation.

269 **The Executive Council adopted** Resolution EC-XXXIII.9.

4.3.4 Global Climate Observing System (GCOS)

270 This Agenda item was introduced by Dr A. Thomas, Director of the GCOS Secretariat in the WMO. He noted that the IOC is a very important co-sponsor of GCOS, and that GCOS greatly values the input to its developing programme made by the IOC Member States, by the Executive Secretary and by the GOOS Secretariat. Since the climate module of GOOS is the ocean module of GCOS, addressing issues of implementation within a mutual reinforcing strategy will be important, if not essential, in the future.

271 Dr Thomas began by discussing the recent progress that bears directly on the implementation of global observing systems for climate.

272 Firstly, in November 1999, the Fifth Session of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) adopted two new decisions on systematic observations:

(i) 4/CP.5 - requires national reporting on global climate observing systems as a part of National Communications to the COP in 2001. National reports are to be prepared in accordance with guidelines prepared by GCOS on behalf of its partners.

(ii) 5/CP.5 – added significantly to the earlier COP-4 decision by:

- extending the preparation of national reports to all Parties and requesting the UNFCCC and GCOS Secretariats to "synthesize" the national reports;
- requesting that GCOS organize capacity-building regional workshops to improve global observing systems for climate in developing countries;
- urging the Parties to address deficiencies in developing countries to allow participation in global observing systems and in consultation with the GCOS Secretariat, to develop specific funding options. GCOS provided the initial quantitative analysis of deficiencies in meteorological and oceanographic systems to COP-5 in Bonn. This analysis is contained in document IOC/INF–1135;
- finally requesting consideration of an intergovernmental process for GCOS.

273 This decision from the COP sets out an extensive agenda for GCOS and its partners and for the sponsoring agencies like IOC, WMO, ICSU and UNEP.

274 Secondly, the GCOS Secretariat took advantage of an informal meeting, convened by Canada in February 2000, on "Developing an Intergovernmental Mechanism or Process for GCOS" to consider a range of possible options and the nature of potential solutions. Several delegates to the IOC Executive Council participated as invited experts. That meeting agreed that an intergovernmental process was needed for implementing GCOS, and that the best solution was to make effective use of the existing intergovernmental mechanisms potentially available to GCOS and its partners, including the IOC Governing Bodies. It also recommended that GCOS develop an Implementation Strategy. Document IOC/EC-XXXIII/2 Annex 7 summarizes many of the key elements of the GCOS implementation strategy and gives some of the key action steps.

275 Dr Thomas reported that GCOS is making progress on this implementation strategy. In terms of an intergovernmental process, GCOS is seeking to:

(i) Use more fully the existing intergovernmental mechanisms of its sponsoring agencies and their appropriate subsidiary bodies.

In May, the WMO Executive Council, taking into account the advice on the intergovernmental process, adopted a wide-ranging resolution on GCOS, with emphasis on its interaction with the UNFCCC, particularly with regard to decision 5/CP.5. Earlier the International Council for Science had adopted a similar resolution.

(ii) Continue to engage the UNFCCC and its bodies, particularly the Subsidiary Body for Scientific and Technological Advice (SBSTA).

In June 2000, the 12th session of SBSTA adopted a conclusion supporting efforts to implement an intergovernmental process for GCOS, urging Parties to support the efforts of GCOS to organize regional workshops, and inviting GCOS to report back on actions concerning decision 5/CP.5.

(iii) Encourage national coordination of all aspects of climate observations across disciplines and domains. GCOS will hold an informal meeting soon to discuss national reports with interested countries.

(iv) Increase the proportion of representatives from national operational agencies on the GCOS Steering Committee.

276 GCOS is embarking on the series of capacity-building regional workshops to develop regional action plans as a basis for proposals to improve regional capabilities. With support from the USA, Australia, WMO and UNEP, the GCOS Secretariat, along with the South Pacific Regional Environment Programme and WMO regional office in Apia, will hold the first workshop covering the island States of the South Pacific region in Samoa in August 2000. Oceanographic issues will be covered at the workshop through the participation of the chair of Ocean Observations Panel for Climate (OOPC) and a significant side event on the Argo programme, hosted by the GOOS Perth Regional Programme Office and GCOS Secretariat.

277 Activities are underway to organize a second workshop in Africa. GCOS has received indications of support from countries for workshops in the Americas and Asia, and is interested in cooperative activities with IOC.

278 **The Executive Council recognized** that the UNFCCC offers an opportunity to enlist another mechanism in support of global observations, **and urged** the delegates of IOC Member States to become actively involved in the Conference of Parties through their national delegations to the UNFCCC, to ensure that sound advice on ocean issues is provided to COP.

279 **The Executive Council noted** the continuing decline in observing systems **and urged** Member States to take steps to remedy deficiencies in the systems so that GCOS will be able to provide information needed for accurate forecasts of climate change.

280 **The Executive Council supported** the initiative to address the deficiencies in the global observing systems through regional capacity-building workshops to allow developing countries to participate in global observing systems for climate (*e.g.,* GOOS/Argo) and to utilize climate data for regional and national applications.

281 **The Executive Council further requested** Member States to support the efforts of the GOOS and GCOS Secretariats on these issues. The Delegate from the USA reported that the USA has donated $50,000 to the support of the GCOS Secretariat.

282 **The Executive Council adopted** Resolution EC-XXXIII.10.

4.4 REGIONAL ACTIVITIES

4.4.1 IOC Regional Committee for the Central Indian Ocean (IOCINDIO)

283 The IOCINDIO Chairperson, Dr A. Muthunayagam introduced this Agenda item by referring to the organization of the Third Session of the IOCINDIO which was held in Tehran, Islamic Republic of Iran, 21-23 February 2000, under the auspices of the Iranian National Centre for Oceanography. He expressed his concern about the low level of participation of IOCINDIO Member States in the meeting. Out of 28 Member States, less than half participated. He reported on the implementation of regional activities since the last IOC Assembly. He then invited the Technical Secretary, Mr Julian Barbière to present the results of the IOCINDIO-III meeting.

284 The Technical Secretary referred to Document IOCINDIO-III/3s, the Executive Summary of the Third Session of the IOCINDIO.

285 In particular, he reported on the progress achieved in the implementation of IOCINDIO-II decisions relating to the development of a project proposal for the establishment of a network of about 40 tide gauges in the region, and a two-day workshop on ICAM, including Marine Pollution which was organized in Tehran just prior to the IOCINDIO-III. The recommendations of the workshop, adopted by the Regional Committee, called for the development of a broad regional strategic ICAM action plan and identified the necessary steps to reach this objective.

286 The Regional Committee also recommended to organize during the intersessional period, a Harmful Algal Blooms (HAB) Training Course, and a Regional Workshop on "Oil Spills Trajectory Modelling", together with the Regional Organization for the Protection of the Marine Environment (ROPME).

287 The Regional Committee established an *ad hoc* working group on capacity building chaired by Dr Partovian of I.R. of Iran with the task to develop a capacity building strategy for the IOCINDIO region in consultation with TEMA.

288 IOCINDIO Member States appreciated the readiness of the IOC Perth Programme Office to assist them in developing GOOS capacity building for IOCINDIO Member States. They will also agree to identify regional activities that will support the development of GOOS in the Indian Ocean.

289 The Committee considered an intent to establish a sub-regional data and information centre for the Persian Gulf in Oman and recommended the IOC Executive Secretary jointly with the Executive Secretary of ROPME and the Director of UNESCO Regional Office in the Arab States of the Gulf to organize consultations with Oman to discuss the proposal and make an assessment of data management facilities of the Sultan Qaboos University of Oman. Consequently the Executive Secretary has sent letters to the region inviting the parties concerned to consider the issue in a constructive manner.

290 During IOCINDIO-III, the delegates also discussed Resolution XX-16 regarding the establishment of an IOCINDIO Regional Support Office. The Committee decided that it was too early to establish a Regional Office for IOCINDIO and recommended addressing the matter again at the next meeting of the Regional Committee.

291 **The Executive Council praised** the progress achieved in the region, and the participation of Arab States in the programme. A few delegates stressed the role of the IOC Programme Office in Perth in facilitating the work of the Committee in relation to GOOS.

292 Several delegations, Canada, India and Pakistan, reported on their national activities in the region and expressed readiness to support the programme. The Observer of Pakistan invited IOC to continue its active role in promoting regional cooperation in the Indian Ocean.

293 The Representative of the International Ocean Institute (IOI) informed the Executive Council that some cooperative activities have been initiated with the IOCINDIO through the IOI operational centre, based at the Indian Institute of Technology in Chennai. He invited IOC to cooperate on the follow-up of the Coastal Mega-cities initiative, so as to reach other sectors of society, and to implement joint activities related to coastal areas and capacity building.

294 **The Executive Council expressed its appreciation** to the Government of the Islamic Republic of Iran for hosting the ICAM and Pollution Studies Workshop and the Third Session of IOCINDIO.

295 **The Executive Council endorsed** the Executive Summary of IOCINDIO-III with appreciation for the successful implementation of IOCINDIO projects during the intersessional period and for the future work plan; **and urged** IOCINDIO Member States to play a more active role in the implementation of the regional committee's programme.

296 **The Executive Council adopted** Resolution EC-XXXIII.11.

4.4.2 IOC Regional Committee for the Central Eastern Atlantic (IOCEA)

297 This Agenda item was introduced by the Chairperson of the IOCEA, Mr J. Wellens-Mensah and complemented by the Technical Secretary, Mr J. Ahanhanzo. The IOCEA-V Session was held in Dakar from 5-11 May 2000. The Chairperson reported on the implemented activities including workshops held on Integrated Coastal Area Management (ICAM), Marine Living Resources, Climate Change and Coastal Processes, Marine Debris Management, and PIRATA, as well as on the launching of the Regional Cooperation in Scientific Information Exchange for the Central Eastern Atlantic (RECOSCIX-CEA) project.

298 The unimplemented activities from the fourth session that are still relevant are incorporated in the IOCEA programme adopted by the fifth session. The limitations in programme implementation are due to lack of funds, especially extra-budgetary resources, and a coordinating mechanism. Nevertheless, the RECOSCIX-CEA and ODINAFRICA-II have successfully obtained substantial funding from the Government of Flanders through the efforts of the IOC Secretariat. IOCEA-V identified the following priority short- and medium-term projects to be implemented in the region:

- sustainable management of marine resources and protection of biodiversity;
- ocean dynamics and impacts on coastal processes;
- marine and coastal pollution.

299 The Chairperson stressed the urgent need for implementation of the following two activities under these projects:

- assessing trends in coastal hazards and associated ocean and climatic processes;
- sediment flux studies in coastal estuaries.

300 Mr J. Wellens-Mensah then referred to IOC Resolution XX-17 of the Assembly regarding the establishment of a regional office. The IOCEA-V Session accepted with much appreciation the offer by Nigeria to host this office, and urged the Executive Secretary to take the necessary steps for the full implementation of this resolution.

301 Regarding the activities implemented as a follow-up of the African Process (PACSICOM, Cape Town and the Partnership conferences), he noted with satisfaction that the OAU Summit of the Heads of States and Governments held in Algiers in July, 1999 endorsed the Declarations and Resolutions of the African Process. He indicated that the IOCEA-V Session adopted four recommendations in support of the IOC activities in the region on:

- coordination and strengthening of IOC activities in the IOCEA region;

- follow-up to PACSICOM and the African Process;
- strengthening of the Large Marine Ecosystems projects in the IOCEA region;
- partnership between IOC and the regional institutions for the long-term development of oceanography and marine sciences in the IOCEA region.

302 Finally he informed the Executive Council that the Sixth session of the IOCEA would be held in Nouadhibou, Mauritania in the year 2002.

303 The Technical Secretary provided details on the Large Marine Ecosystem Projects and the African Process. He pointed out the good attendance at the Session and took the opportunity to thank Canada and France for assisting the IOC Secretariat by providing funds to support the participation of the delegates from the region. The participation in the Session of Representatives of UNEP, ONR/USA, NAVO/USA and NOAA/USA was also appreciated.

304 The Delegate of South Africa indicated that the South African Minister for Environment and Tourism and Chairperson of the Preparatory Committee for the Partnership Conference, Mrs R. Mabudhafasi, and the Coordinator of the Secretariat of the Preparatory Committee, Mr A. Share, attended the IOCEA-V Session. This high level participation of South Africa demonstrates the support of his country to the IOCEA region. He urged the IOC Executive Council to support the African Process.

305 The Delegate of Nigeria thanked the IOC Executive Secretary for its support to the IOCEA activities. He reminded the Council that Nigeria provided the logistics of the research vessel for the first IOCEA cruise in 1989. He thanked the partners, particularly the USA, who support activities in the region and urged other donors to provide assistance for joint projects and capacity building.

306 The Delegate of Morocco noted with satisfaction that countries from the two regional committees in Africa are involved in the ODINAFRICA-II project. Morocco requested that the priority given to Africa within UNESCO be reflected in the IOC programme and budget. She referred to the Argo project and pointed out the possible legal implications of the drift of the deployed buoys into the zones under the national jurisdiction of coastal States. She stated a need to define the appropriate legal instruments and mechanisms involved.

307 The Delegate of Canada stressed that the strategy of his country is to give the leadership and ownership to the regional institutions for elaboration and implementation of the cooperative projects. He reconfirmed the full support of Canada to the activities of the Committee and to the IOCEA regional office.

308 The Delegate of Ukraine thanked the Chairperson for his comprehensive report and referred to a long history of research experience by his country in the region. He welcomed the new project-oriented approach of the Committee and indicated that his country has a lot of data that could be made available.

309 The Delegate of Portugal noted with regret that because of the difficulties in communication with the Secretariat, his country was not able to provide the anticipated support for some planned IOCEA-IV activities and the organization of IOCEA-V Session. Portugal has already edited one bathymetric chart that will be distributed to the Member States, and will continue to develop cooperation for the reinforcement of capacity building in the Portuguese-speaking countries.

310 The Delegate of India informed the Executive Council that his country wishes to offer suitable acoustic tide gauges to Ghana in support of sea-level measurements in the IOCEA region. He pledged to support south-south cooperation.

311 The Representative of the International Ocean Institute (IOI) indicated that IOI is in the process of widening its cooperation with the region. He informed the Council about the IOI Operational Centres in Dakar and South Africa. Another centre is planned to be established in Nigeria. IOI is a partner for the African Process and is involved in the institution and capacity building in the region. IOI will continue to support the activities in the region.

312 The Representative of the Organization of the African Unity (OAU) reminded the Executive Council that the OAU Summit of the Heads of States endorsed the Declarations and the Resolutions of the African Process. He noted with satisfaction the results and the pertinent recommendations of the "African Ocean Days" and stressed the importance of UNCLOS for the development and protection of the marine and coastal environment in the region.

313 Considering that institutional mechanisms and legal instruments can be effective aids to intra/inter-regional cooperation, t**he Executive Council invited** the Executive Secretary to strengthen cooperation with regional organizations like the OAU in IOC programmes in the region.

314 **The Executive Council reinforced** the need for support in implementing activities specified by IOCEA-V and for close collaboration with regional institutions.

315 **The Executive Council welcomed** the organization of the symposium of the OAU inter-regional Group of Experts on the aquatic resources **and invited** Member States to support this endeavour.

316 **The Executive Council reconfirmed** that Africa is a priority as is shown by the creation of one project office in the IOCINCWIO region while a second office is being considered for the IOCEA region, recognizing that, as elsewhere, the bulk of resources for implementing African projects have to come from extra-budgetary sources. **The Executive Council was pleased** to note the success of ODINAFRICA in this regard. Member States were **urged** to support African projects.

317 **The Executive Council adopted** Resolution EC-XXXIII.12 and Resolution EC-XXXIII.13.

4.4.3 IOC Regional Committee for the Cooperative Investigations in the North and Central Western Indian Ocean (IOCINCWIO)

318 This Agenda item was introduced by Mr Mika Odido, Head of the IOCINCWIO Project Office. Mr Odido informed the Executive Council that as follow-up to IOC Resolution XX-15, the IOCINCWIO Project Office was officially inaugurated on 8 February 2000 at the Kenya Marine & Fisheries Research Institute (KMFRI) Headquarters in Mombasa, Kenya. On that occasion the IOC and the KMFRI also signed a Memorandum of Understanding to serve as a framework for the establishment and operation of the IOCINCWIO Project Office. Under this agreement KMFRI is providing office space and equipment, as well as two support staff, while IOC has hired Mr Odido as Consultant to head the Project Office, and provides financial support for the operational expenses of the office.

319 The main purpose of the IOCINCWIO Project Office is: (i) to facilitate and coordinate the implementation of the IOC Programme activities in the IOCINCWIO region; (ii) to advise IOCINCWIO Member States on the formulation of project proposals; (iii) to liaise with IOCEA Member States through the IOCEA Chairperson; (iv) to promote Pan-African cooperation and coordination; (v) to contribute to, and assist the 'African Process'; (vi) to assist in the implementation of the ODINAFRICA project(s); (vii) to promote IOC in the region and to establish and maintain relations with relevant organizations, agencies, institutions and individuals with the view of ensuring complementarity and to stimulate south-south cooperation.

320 The project office has reviewed the implementation status of the IOCINCWIO Work Plan for 1997-2001 as adopted by the Fourth Session of IOCINCWIO held in Mombasa, Kenya in 1997. Thanks to substantial extra-budgetary support provided by the Governments of Sweden and Flanders (Belgium) a substantial number of activities have been implemented, including: Harmful Algal Bloom Programme; biodiversity; draft manual on guidelines for assessment, monitoring and management of physical shoreline changes in the Western Indian Ocean; various activities related to ICAM; and the Ocean Data and Information Network for Eastern Africa (ODINEA) project.

321 It has not been possible to implement all the activities envisaged in the IOCINCWIO Work Plan during the period 1997-1999. This is mainly due to the need for extra-budgetary resources to implement the recommended programme, which would require approximately $700,000. Activities that were not implemented include: establishment of a regional group of experts on Oceans and Climate; development of an LME project proposal; monitoring of shoreline changes; marine pollution monitoring, marine debris studies, GOOS awareness workshop, upgrading of sea level stations; and mapping of critical habitats. For implementation of activities planned for 2000-2001 a further $360,000 needs to be acquired primarily from extra-budgetary sources.

322 The clear statements made during PACSICOM need follow-up action. The region now has the human resources, but needs financial resources to effectively respond to the needs expressed by the policy makers at PACSICOM.

323 Mr Odido noted that the 10-year cooperation agreement between IOC and Sweden expired at the end of 1999 only with a small continuation grant available during 2000. He appealed to other Member States to provide support to fill the gap left by Sweden and to other donors and partners to increase their support to enable the IOCINCWIO to continue its strong and dynamic programme.

324 Funds have been successfully obtained from the Government of Flanders, which has indicated its intention to provide $2 million to support the development of the Ocean Data and Information Network for Africa – Second Phase (ODINAFRICA-II), involving 20 African IOC Member States over the next four years. The First Planning Workshop for the ODINAFRICA-II project was held in Dakar, Senegal from 2-4 May 2000 during which the management structure, work plan and budget for the project were discussed and approved. The summary report of the workshop was available as IOC Workshop Report 167.

325 The Delegate of Belgium recalled the start of the IOC-Flanders cooperation in 1998 and expressed his high satisfaction with the achieved results of the ODINAFRICA-I project during the past three years. He then referred to the new UNESCO-Flanders Agreement through which the Government of Flanders (Belgium) will provide $1 million /year to UNESCO for Science Sector activities with an initial focus on IOC and IHP activities. The IODE project ODINAFRICA-II has

been submitted by UNESCO to Flanders within the framework of the said Agreement. Final approval of the proposal is expected shortly.

326 The Delegate of Mozambique expressed appreciation to IOC for the substantial support provided for capacity building activities in the region. Steps should now be taken to enable IOCINCWIO Member States to participate in IOC's monitoring and operational programmes. He also called for IOC to promote the strengthening of national structures to improve institutional capacities and national policies. Partnership between national research institutions and the private sector should also be encouraged. Mozambique reaffirmed its commitment to improve its institutional capabilities in collecting and processing oceanographic data to better participate in IOC programmes.

327 The Representative of the World Meteorological Organization informed the Council that in order to increase the number of trained personnel involved in marine activities in Africa, the draft project document for 'Western Indian Ocean Marine Applications Project' (WIOMAP), including in particular its capacity building component, was prepared by WMO. It will be finalized and submitted for funding as soon as possible.

328 The Representative of the Organization of African Unity (OAU) expressed his organization's appreciation to IOC for supporting various regions of Africa including IOCINCWIO. He reconfirmed OAU's preparedness to collaborate with IOC in activities relevant to his organization's mandate.

329 **The Executive Council noted with appreciation** the establishment of the IOCINCWIO Project Office **and congratulated** Mr Odido with his appointment as Head of the Office.

330 **The Executive Council noted with concern** the fact that the offices of the Chair and Vice-Chair of the Regional Committee have fallen vacant **and urged** the IOC Executive Secretary to request the IOCINCWIO Member States to provide guidance on alternative arrangements that should be put in place till the next session of IOCINCWIO planned for the second half of 2001.

331 **The Executive Council further noted** the cooperation with the International Ocean Institute (IOI) and the capacity building initiatives of WMO in the region within WIOMAP, **and called for** continued close cooperation with IOC in this regard.

332 **The Executive Council also noted with satisfaction** the progress made in the implementation of the IOCINCWIO Work Plan, and invited IOC Member States to continue and expand their support to the region, with special attention to operational activities.

333 **The Executive Council expressed** thanks to the Governments of Belgium and Sweden for the support they have provided to the programme during the past 10 years and to Kenya for the support to the IOCINCWIO Project Office. **The Executive Council requested** the Secretariat to assist in identifying funds to enable implementation of the IOCINCWIO-IV Work plan.

4.4.4 Caspian Sea

334 Dr I. Oliounine, IOC Consultant, informed the Executive Council on the IOC activities implemented by the IOC and other international organizations in the Caspian Basin.

335 The Caspian Region suffers from various contributions to environmental stress and the IOC can play an important role in coordination of the scientific research, monitoring and protection activities.

336 Dr Oliounine emphasized that the IOC Governing Bodies always recognized the urgent need for a cooperative multidisciplinary study of the Caspian. He referred to the decisions of the 19th and 20th sessions of the IOC Assembly, particularly to Resolution XX-19, and described the progress achieved in its implementation: the project on Floating University for the Caspian Sea is discussed in detail under Agenda Item 5; launching of the demonstration project for the Volga River and Caspian Sea Basins is considered under Agenda Item 8; IOC is cooperating with the Caspian Environmental Programme (CEP) in coastal management and capacity building efforts. Five training courses will be implemented by IOC, funded by CEP, one for each of the Caspian bordering countries, on integrated coastal management and related data and information collection and processing in November-December 2000.

337 Dr Oliounine then referred to numerous projects carried out by other international organizations, such as World Meteorological Organization (WMO), International Atomic Energy Agency (IAEA), European Union (EU), United Nations Industrial Development Organization (UNIDO) and others in the region, with the objective of protecting the Caspian Marine Environment and of aiding to the sustainable development of the riparian States.

338 He invited the Council to recommend a mechanism of cooperation that should be used with the countries of the region and international organizations with an interest in the region, and to identify actions required.

339 **The Executive Council reiterated** the importance of the Caspian Sea studies and of the IOC contributions to this process.

340 **The Executive Council expressed** satisfaction that the IOC activities in the region are in line with Resolution XX-19 and with the decisions of UNESCO General Conference relating to integration of the knowledge and experience of the intergovernmental UNESCO programmes.

341 The Delegate of the Russian Federation recommended organizing a coordination meeting of the representatives of the international organizations under the leadership of IOC in Astrakhan (Russian Federation), with the participation of all Caspian bordering countries, in order to develop common mechanisms for coordination and implementation of activities in the region. He invited IOC to participate in the International Conference on sturgeon planned for September this year in Astrakhan. Finally, it was proposed that IOC would develop a draft convention on scientific research in the Caspian Sea as it has already been done for navigation and fisheries.

342 **The Executive Council shared** the concern of the WMO Coordination Committee on the hydrometeorology and pollution monitoring of the Caspian Sea regarding the degradation of the networks of hydrometeorological observing sites.

343 **The Executive Council invited** the IOC Executive Secretary to consider ways of participating in the Fifth Session of the WMO Coordination Committee planned for September 2000 in Alma-Ata (Kazakhstan), and to bring to the Session the decisions of the IOC Executive Council regarding the cooperation in the Caspian Sea.

344 **The Executive Council recommended** that the Secretariat, jointly with the IOC Member States concerned, should identify the actions to be implemented for the improvement of cooperation in the region at all levels - national, regional and international.

345 The Observer from Azerbaijan called on the Executive Secretary to send a mission to the country to help it to organize coordination of the efforts for Caspian Sea protection.

4.4.5 Other regions

(i) IOC Regional Committee for the Southern Ocean (IOCSOC)

346 This Agenda item was introduced by Dr Max Tilzer, Chairperson of IOCSOC, who noted that since the last meeting of IOCSOC there have been considerable changes within the IOC, including the rapid development of GOOS and the creation of JCOMM, which includes a group dealing with operations in polar regions. As GOOS and JCOMM bear the responsibility for oversight of operational oceanography in the Southern Ocean and elsewhere, it appears necessary to revise the Terms of Reference of IOCSOC so that they focus on research activities.

347 Dr Tilzer emphasised the importance of the Southern Ocean as the world's largest upwelling area, and listed several key research areas where improvements in coordination are desirable, including the role of the Southern Ocean in the global climate system, in global bio-geo-chemical cycles, and in maintaining biodiversity.

348 He suggested that the IOC should be involved in this coordination by some means, and that an *ad hoc* group comprising representatives of IOC, WMO, SCAR, SCOR, and the Chair of IOCSOC, be assigned the task of developing a revision to the Terms of Reference of IOCSOC for presentation to the IOC Assembly in 2001. The *ad hoc* group could also be asked to define research priorities and links between existing projects.

349 **The Executive Council thanked** Dr Tilzer for providing content to IOC activities in the Southern Ocean. **The Executive Council noted** that IOCSOC was different from the other IOC regional bodies, whose role was to implement IOC programmes among geographically related Member States. Partly because of this, the IOCSOC had found it difficult to maintain momentum and to develop or implement programmes. **The Executive Council recognized** that there is an ongoing need for the coordination of basic research activities in the Southern Ocean, but **agreed** that such coordination might be better achieved by means of a different mechanism from the IOCSOC. **The Executive Council asked** the Executive Secretary to convene an *ad hoc* group comprising representatives of IOC, SCOR, SCAR and WMO, to propose to the 21st Session of the IOC Assembly a suitable alternative mechanism in which IOC could work in partnership with others on the coordination of basic research in the Southern Ocean. Among other things the group should (i) analyze the needs for a coordination mechanism; (ii) show how the activities of such a mechanism relate to the IOC's mandate; and (iii) indicate how it relates to the interests of Member States in the Southern Ocean.

350 **The Executive Council adopted** Resolution EC-XXXIII.14.

351 **The Executive Council requested** the Executive Secretary to ensure that GOOS and JCOMM take proper cognisance of the need for coordination of operational activities in the Southern Ocean. **The Executive Council invited** Member States to consider how an ice-breaking research ship might be made available for the Global Ocean Ecosystems Dynamics (GLOBEC)

work in the Southern Ocean in the period April-August 2002 and inform the Executive Secretary accordingly.

(ii) Mediterranean Sea

352 The Head of the Ocean Sciences Programmes Section (IOC/OSP), Dr Umit Unluata, introduced the Agenda item.

353 He pointed out that IOC continues its efforts towards establishing an integrated approach to the development of research, operational oceanography and services across the Mediterranean, including MedGOOS, MedGLOSS, ICAM and data exchange under IODE. These efforts encompass a strong component in training, education and mutual assistance.

354 Dr Unluata further pointed out that at its 20th session, the Assembly instructed the IOC Executive Secretary to 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 (IOC-XX/3, Para. 337). This request has not been completed but the process for the formulation of a science plan for a unified Mediterranean programme has been initiated and is presently underway.

355 Dr J. Morelli of the IOC/OSP Section provided a summary of activities developed since the last Assembly on matters related to integrated coastal area management in the Mediterranean. In the framework of the UNESCO inter-sectoral cooperation, IOC is contributing together with the Unit on Coastal Areas and Small Islands (UNESCO/CSI), International Hydrological Programme (IHP), Management of Social Transformations Programme (MOST) and UNESCO Culture Sector to activities on sustainable development of coastal historic cities in the Mediterranean, with the aim of drawing attention to the socio-economic impacts on their marine environment. An international seminar with focus on strategies for the Mediterranean ICAM was organized by IOC, in partnership with the French Provence-Alpes-Côte d'Azur Region (Avignon, 20-21 October 1999). Scientists and policy makers from 9 Mediterranean countries attended the meeting, as well as experts and authorities from international, national and regional institutions (including MAP/UNEP, CIESM and representatives of four Ministries of Environment). The Seminar recommended reinforcement of synergies between interdisciplinary marine and coastal research and socio-economic actors, inter-institutional dialogue, inter-regional cooperation, and capacity building, with a view to promoting sustainable development in the Mediterranean Basin. As a follow-up, IOC took the initiative for organizing, in partnership with the University of Nice-Sophia Antipolis, an advanced course on Med-ICAM, to be held in Nice (France), from 4 to 15 September 2000 with the sponsorship of the European Commission (DG-XII), UNESCO, the Provence-Alpes-Côte d'Azur Region, and IGU (*Oceans 21* Programme).

356 Dr Francesco Civili, Coordinator of the Programme for the Assessment and Control of Pollution in the Mediterranean region (MED POL), which is implemented under the Mediterranean Action Plan of the United Nations Environment Programme (UNEP/MAP), presented to the Council a summary of the relevant MED POL / MAP activities. The importance of coordination of MAP activities with the UN agencies, including IOC, on issues that are focused on social, economic, legal matters and capacity building was stressed. Finally Dr Civili summarized the progress achieved in developing new institutions in support of the sustainable development of Mediterranean coastal zones, specially the extension of the ambit of regulations beyond the coastline to all the catchment basins surrounding the Mediterranean.

357 **The Executive Council expressed** its satisfaction with the progress in IOC's efforts to develop an integrated framework for the Mediterranean ocean science, observing system and ocean services, and with progress related to the development of coordinated ICAM activities, including capacity building in the region, **and reiterated** its support for the development of a unified Mediterranean science programme in accord with the decision of the 20th Assembly (IOC-XX/3, para. 333-337).

(iii) European Seas

358 The DG-XII Directorate for Science, Research and Development of the European Commission plays a major role in promoting and supporting marine research programmes in European Seas. Considering that 14 of the European Union nations are also IOC Member States and 9 of them are members of the IOC Executive Council, Dr C. Patermann, DG-XII Director, was invited to attend the 33rd Session of the IOC Executive Council. He was represented by Mr G. Ollier who summarized the main objectives of European research related to sustainable marine ecosystems:

- to develop the scientific knowledge on marine processes, ecosystems and interactions,
- to analyze causes, consequences and solutions of the present anthropogenic impact on marine ecosystems,
- to develop the capacity for monitoring and managing coastal processes,
- to enable operational forecasting for offshore activities.

359 Mr Ollier provided the Council with helpful information on the main projects carried out in various European Seas, such as MTP II-MATER and GEOSTAR (Mediterranean), BASYS (Baltic), ENAM, OMEX and STRATAGEM (North Atlantic). Concerning the interests of marine scientists from non-Member States of the European Union (particularly the scientific community of the Mediterranean Basin), there are some possibilities of additional funds in the projects coordinated by the European groups.

360 **The Executive Council noted** the information **and recommended** that bonds of cooperation between the European Union DG-XII and IOC should be extended and strengthened.

4.4.6 Policy on Regional Programmes, Offices and Staffing

361 The IOC Executive Secretary introduced this Agenda item by referring to Document IOC/EC-XXXIII/2 Annex 8.

362 IOC has a long-standing policy of supporting the regional implementation of the Programme through the establishment of Regional Subsidiary Bodies *(Sub-Commissions and Regional Committees*). Two Sub-Commissions and five Regional Committees are currently active. Other mechanisms for regional implementation are also done through Memoranda of Understanding (MoU) with different organizations.

363 In the most recent sessions of IOC Governing Bodies, regional groups of Member States have increasingly stressed the need to support the work of regional committees by the establishment of regional offices of the IOC (*e.g.*, Resolution XX-15, IOCINCWIO; XX-16, IOCINDIO and XX-17, IOCEA).

364 Through the reform process initiated by the UNESCO Director-General, the Organization has engaged in a critical review of its decentralization policy, and in particular with regards to the cost-effectiveness of running small UNESCO Offices, and the need for evaluating their performance. The general trend followed by UNESCO seems to favour the establishment of multi-sectoral regional offices serving the needs of clusters of countries.

365 In the last year, following the offer and support of Member States (Australia and Kenya) IOC established two Offices in Perth and Mombasa. The Perth Office serves a specific Programme, GOOS, in the Indian Ocean and South Pacific Region. The Mombasa office serves the ODINAFRICA Project in the IOCINCWIO Region.

366 In both cases the offices were established:

- with substantial support from the host country, and the additional cost (usually the salary of one professional) being partially funded by extra-budgetary resources of the Project or Programme;
- within functioning national agencies, that provide administrative support and an appropriate working environment;
- for a given period of time, since they have built-in "*sunset clauses*", established by the duration of the Project;
- without committing a permanent UNESCO/IOC staff post.

367 The Executive Secretary proposed as a general policy to use Project Offices along the above lines as the main mechanism to support the regional implementation of the Programme, instead of decentralized permanent units of the Secretariat. Such a policy would be better adapted to the level of resources available to the Commission, without diminishing its human capacity at Headquarters below critical mass.

368 Several Member States noted the novel approach promoted by the Executive Secretary and stressed the importance of IOC being actively present at the regional level.

369 **The Executive Council noted** that the scope and role of the Project Office and the Regional Office differ and have specific terms of reference covering their functions. IOC Project Offices are established with a limited project focus and are the result of agreement between IOC and a host country. They have sunset clauses and are subject to regular evaluation. On the other hand, IOC Regional Offices have an open-ended mandate and are not specific to any projects as they are established to serve the need of a region and promote cooperation among Member States. According to these definitions, the Perth and Mombasa Offices are Project Offices. The Delegate of India referred to the decisions of IOCINDIO-III to continue consideration of the establishment of an IOCINDIO Regional Office at its next meeting, and the need for a clear commitment from the host country and other Member States from the region.

370 The IOCEA Chairperson referred to the need for coordination and assistance in the IOCEA region, and recalled the recommendation of this Committee to establish an IOCEA Regional Office, following the offer of Nigeria to host such an office.

371 **The Executive Council expressed** the need for increased cooperation between the IOC Regional Offices and Project Offices, with UNEP Regional Seas Secretariat, FAO Commissions, and UNESCO Regional Offices. Some delegates invited the Executive Secretary to appoint IOC

staff as heads of the IOC Regional Offices and ensure that persons are present at the IOC Headquarters to liaise with the different regional bodies.

372 The Delegate of Colombia thanked IOC for providing continuity in the contractual arrangement for the Head of the IOCARIBE Regional Office, and for starting the recruitment procedure of a new Head.

373 **The Executive Council welcomed** the creation of regional Project Offices as a way to maximize the resources of the Commission and to complement the actions of the Regional Offices.

374 **The Executive Council recognized** the needs of IOC's Regional Subsidiary Bodies for assistance on implementation of IOC programmes; **considered** that Project Offices are meant for implementation of specific projects only and could not be assigned the role of Regional Offices; **and called for** supervision of the Project Offices from the Executive Secretary.

375 **The Executive Council requested further** the IOC Executive Secretary to draw up guidelines and a long-term strategy, in consultation with Member States, for the establishment of IOC Regional Offices and Project Offices, taking into account the concerns of the regional committees of IOC and the UNESCO's overall policy on decentralization, and to present these guidelines to the 21st Session of the IOC Assembly.

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

376 The Coordinator of TEMA, Mr V. Scarabino, presented Document IOC/EC-XXXIII/2 Annex 9 with information on activities carried out since the last IOC Assembly and planned for the near future in the framework of the management structure of TEMA.

377 The TEMA Report was complemented by Member States statements on their activities in capacity building: the Delegate of Thailand informed about the establishment of a regional graduate school of oceanography; the Observer from the Islamic Republic of Iran offered an Iranian national university in one of the coast cities of the Persian Gulf to become a Regional University and/or Regional Graduate School of Oceanography; the Delegate of the Republic of Korea informed about the IOC/KOICA training programme for marine environment conservation in operation since 1997. This last course was held in November 1999 with the participation of 20 oceanographers. The Delegate of the Republic of Korea offered the facilities of AMETEC, *i.e.* the Marine Environmental Training and Education Centre of the Asia-Pacific Economic Cooperation Council (APEC), establishing a standard measuring system of marine environment; the Delegate of Japan mentioned the success of training activities in the Asian region, organized by his country since 1988 with the support of Japan International Cooperation Agency (JICA) and Japan Society for Promotion of Sciences (JSPS), in which more than 700 Japanese professionals and a large number of scientists and students from Asia took part; the Delegate of Canada referred to the graduate scholarships in marine affairs provided through the Canadian International Development Agency (CIDA). The Delegate of Venezuela informed about the facilities of research and training that the Project CARIACO offers to the IOCARIBE region concerning the carbon cycle in a coastal sea.

378 A few delegates expressed a need for support in capacity building and training activities especially for the IOCARIBE region and for northern Africa. The benefits of implementing on-the-job-training programmes, including training of technicians, were stressed.

379 **The Executive Council expressed** strong support for the TEMA programme **and requested** the Executive Secretary to facilitate actions in implementing the Recommendations of the 20th Session of the IOC Assembly relevant to the survey of "TEMA needs" and the establishment of an External Advisory Group. Regarding the evaluation of needs, the Delegate of Colombia recommended that the survey be designed taking into account the Member States different levels of capacities.

380 In response to a proposal from the Observer from I. R. of Iran, **the Executive Council stressed** a need to use regional TEMA focal points for advising the Secretariat on planning and implementation of capacity building activities and for making them responsible for organizing response to TEMA questionnaire survey.

381 **The Executive Council invited** the Executive Secretary to identify a clear TEMA focal point within the IOC Secretariat.

382 **The Executive Council noted** with satisfaction the establishment of an *ad hoc* group for evaluation of the capacity building efforts in the IOCINDIO region and development of a future strategy. **The Executive Council supported** a comprehensive assessment of TEMA activities carried out in developing countries in order to evaluate the institutional and national impact achieved.

383 **The Executive Council advised** that more attention should be paid to modern methods of training such as distant learning and on-the-job-training.

384 **The Executive Council invited** the Executive Secretary to reinforce IOC's relationship with NGOs, such as SCOR and IOI, in capacity building efforts, as well as with other UN agencies, particularly WMO and FAO, and other UNESCO programmes and projects. The Delegate of Colombia stressed the role played by the UNESCO Chair in training young scientists in Central and South American regions and recommended that this programme be continued. He also pointed out the IOC support jointly with the UNESCO Education Sector for the implementation of a Post-graduate Training Programme in Marine Science for Central American Scientists, and recommended its extension to other regions, in view of its importance as a "breeding ground" for future young people interested in the marine science theme.

385 Dr Neil Kenyon, coordinator of the Training-Through-Research Programme, presented an account of the Mediterranean, Black Sea 'Floating University' facilities being developed under TEMA. This 'Floating University' has been operating successfully for 10 years and has concentrated on 'training-through-research' (TTR) in geoscience and benthic biology on continental slopes and rises. To date, approximately 370 scientists and students from 25 countries have taken part in its annual cruises. In addition to the cruises, there are annual post-cruise conferences that bring in the wider scientific community. Cruise reports are published in the IOC Technical Series and the project has an impressive record of referred publications. A small, but indispensable IOC financial contribution is complemented with important support from European projects, universities and oil companies. Future cruises are planned to West Africa and to eastern South America. This will extend the TTR Programme activities to countries outside the Mediterranean-north-east Atlantic region.

386 The Delegate of the Russian Federation highlighted the Baltic Floating University Project in operation since 1993, and referred to Document IOC/INF-1141 with the proposal for extending the Floating University approach to the Caspian Sea.

387 **The Executive Council commended** the Floating University projects **and confirmed** its full support to the concept. **The Executive Council supported** the idea to export the TTR philosophy to other regions, noting that the implementation of the Floating University in the Caspian Sea will help to promote and improve scientific knowledge of young scientists, regional cooperation and marine data coverage.

388 The Delegate of the Russian Federation then invited Member States to the next Congress on "the History of Oceanography", to be held in Kaliningrad, Russian Federation in 2003, and proposed that the Secretariat include this event in its calendar of activities and organize necessary support.

389 The Delegate of Nigeria supported the Floating University Programme as an effective way of enhancing capacity and urged for a similar programme for the IOCEA region. The offer by Canada to provide scholarships for training was also acknowledged.

390 The IOC Executive Secretary reminded delegates that TEMA had the largest budget of all IOC programmes in 1999. He appealed to Member States to give financial support and in-kind contributions to TEMA activities.

391 **The Executive Council adopted** Resolution EC-XXXIII.15.

6. IMPLEMENTATION OF ACTIONS RELATED TO UNITED NATIONS (UN) CONVENTIONS

6.1 PROGRESS ON THE INTERNATIONAL OCEAN ASSESSMENT REPORT

391 The President of SCOR, Prof. John Field, presented this Agenda item.

392 As requested by the 31st Executive Council (1998) and the 20th Assembly (1999) of IOC, IOC, SCOR and SCOPE held a joint workshop in Potsdam, Germany, from 2-6 October 1999, to assess the state of marine science in relation to sustainable development, and to consider how marine science and technology for sustainable development might develop over the next 20 years. The workshop was attended by 60 experts, many of whom made presentations based on background papers on key topics. The fruits of the workshop will appear as a book and will constitute the report of the meeting.

393 Prof. Field drew the attention of the Council to Document IOC/INF-1132, which sets out the contents of the book and the proposed publication schedule. The production schedule had slipped somewhat and the publication is expected by year-end. The draft book will be sent to two external scientific reviewers. A science writer has been contracted to write a 30-page summary of the book for policy-makers and the public. It was proposed that a science writer should also be engaged to provide an editorial review of the entire book to ensure consistency of style.

394 **The Executive Council was pleased** with the progress reported and a special vote of thanks went to Liz Gross from SCOR and Colin Summerhayes from IOC for their work behind the scenes to organize the meeting and coordinate the review process.

395 **The Executive Council noted** that Liz Gross was leaving the SCOR Secretariat, **thanked** her warmly for her many positive interactions with the IOC in many different ways over the past 20 years, **and wished** her well in her retirement.

6.2 IOC AND THE UNITED CONVENTION ON THE LAW OF THE SEA (UNCLOS)

396 Ms D. Beye, Technical Secretary, introduced this Agenda item, starting with a background on the IOC activities in relation to UNCLOS. She recalled that the legal status and liabilities of research equipment deployed at sea in the context of the Ocean Data Acquisition System (ODAS) was the first IOC legal activity dealing with the Law of the Sea. She further recalled the different Inter-sessional Working Groups set up to clarify the IOC role in relation to UNCLOS.

397 Recalling the mission and activities of the Advisory Board on Hydrographic, Geodetic and Marine Geo-Scientific Aspects of the Law of the Sea (ABLOS), she pointed out that this Group intends to promote regional activities, particularly in the Atlantic with regard to the implementation of article 76 of UNCLOS. She also recalled the cooperation with the institutions established by UNCLOS such as the Commission on the Limits of the Continental Shelf (CLCS), the International Seabed Authority (ISA), and the International Tribunal for the Law of the Sea (ITLOS): IOC provided information on its programmes dealing with the CLCS activities to meet a request of the CLCS Chairperson in accordance with Art. 3 of Annex 2 to UNCLOS; discussions are underway to assist the Special Chambers of ITLOS and a Memorandum of Understanding is being signed between ISA and IOC on the provision of oceanographic information and data from IOC/IODE World Data Centres. IOC has also developed cooperation with DOALOS and IMO in order to share information and experiences in the implementation of UNCLOS.

398 Ms Beye informed the Council about the organizational arrangements related to the First Meeting of the Advisory Body of Experts on the Law of the Sea (ABE-LOS). As of 31 January 2000, 94 experts from 49 Member States have been nominated as delegates to ABE-LOS. In order to reach agreement on the Agenda, a letter and a questionnaire will be sent to the Member States in July 2000.

399 Several delegates suggested the following items to be considered in drafting the Agenda of the first ABE-LOS meeting: the guidelines for implementing Art. 143, 246, 247 and 249 of UNCLOS; the Chapter XIVe on Transfer of Marine Technology; capacity building related to Art. 76 of UNCLOS, Ocean Data Acquisitions Systems (ODAS) including Argo; the reinforcement of the cooperation with IHO through ABLOS mechanisms; and the nature and implications of marine scientific research. That is consistent with the recommendations in Document IOC/INF-1114. The Delegate of China proposed that working groups be set up within ABE-LOS, with a limited membership focussed on different issues. Several delegations supported this view.

400 The Delegate of Turkey informed the Council that Turkey is considering appointing two experts to the Advisory Body of Experts on the Law of the Sea (ABE-LOS) and will provide their names to the Secretariat shortly. He mentioned on the other hand that Turkey is not a party to the UN Convention on the Law of the Sea. *(The full text of this statement is given in Annex III-F).*

401 The Delegate of Venezuela requested that attention be given to the implications of IOC actions regarding projects involving IOC Member States which, as this is the case of Venezuela, are not part of UNCLOS.

402 The Delegate of United Kingdom informed the Council that, due to the lack of national legislation dealing with autonomous vehicles used for marine scientific research, scientists in his country are working on a Code of Practice to be used on a voluntary basis in UK waters, and offered this experience to interested countries.

403 The Delegate of Japan pointed out the complexity of procedures to obtain oceanographic survey permissions allowing ocean observations. He suggested that IOC provide information related to permission applications. ABE-LOS could establish a small working group to serve this purpose.

404 The Representative of the International Hydrographic Bureau of IHO reiterated the interest of his Organization to reinforce the cooperation with the IOC in the framework of ABLOS and other IOC activities.

405 **The Executive Council**, recognizing that ABE-LOS is very important to the work of IOC, **requested** the IOC Executive Secretary to convene the First Meeting of that Group using the questionnaire approach to reflect the Member States requirements on the Agenda.

7. COOPERATION WITH UN AND NON-GOVERNMENTAL ORGANIZATIONS

7. 1 REPORT ON THE ADMINISTRATIVE COMMITTEE ON COORDINATION – SUB-COMMITTEE ON OCEANS AND COASTAL AREAS (ACC-SOCA)

406 The IOC Executive Secretary introduced this Agenda item by recalling that the ACC Sub-Committee on Oceans and Coastal Areas (ACC-SOCA) is the Task Manager of Chapter 17 of *Agenda 21* and that IOC chairs the ACC-SOCA and has been the secretariat of the Sub-committee since its establishment in 1993. He noted that the report of the Eighth Session of SOCA distributed to the Council (Doc. ACC/2000/8) provides information on the recent activities of SOCA in greater detail. In addition, the Executive Council's attention was drawn to the SOCA brochure distributed as an information document which describes the Sub-Committee and its tasks.

407 The Executive Secretary noted that the Eighth Session of the ACC-SOCA held at the GPA Headquarters in The Hague during 19-21 January 2000, considered, among others, progress on the UN Atlas of the Ocean; status of implementation of the Global International Water Assessment (GIWA); status of implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA); creation of the new UN open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) by the UN General Assembly; and participation in Rio+10 review of *Agenda 21*, in relation to oceans and coastal areas. The Executive Secretary pointed out that the discussions of ACC-SOCA on the role of the Sub-committee in UNICPOLOS held prior to its first meeting would be presented under Agenda Item 7.2.

408 The Executive Secretary recalled that the IOC Officers at their meeting in January 2000 invited the Executive Secretary to investigate with the Director-General of UNESCO the

revitalization of ICSPRO and the possibility of using this agreement as part of the process identified for discussion at the forthcoming UNICPOLOS. The Executive Secretary pointed out that while the ACC-SOCA is made up of senior sector specialists from the agencies of the UN system with activities in ocean and coastal areas, the ICSPRO is made up of the Heads of the cooperating agencies. As a result, coordinated executive action for SOCA can only ensue following the due process of endorsement and financing within each agency's governing structure. In spite of this fact, the offer made by the IOC Chairperson to consider ICSPRO as an executive high level coordination mechanism for ocean and coastal zones was not received enthusiastically at the UNICPOLOS meeting.

409 In the ensuing discussion one delegation reaffirmed its strong support for ACC-SOCA alone as an important platform for IOC's visibility while others recommended the revitalization of ICSPRO as a mechanism complementary to ACC-SOCA. With limited number of agencies represented at the high level, ICSPRO merits special attention while ACC-SOCA constitutes an effective mechanism for exchanging information requiring coordination among the agencies.

410 **The Executive Council encouraged** the revitalization of ICSPRO as a high level executive mechanism to complement ACC-SOCA in order to respond more effectively to the new needs in ocean management.

411 As regards the preparations for the Rio+10 process, **the Executive Council stressed** the need for compiling basic information on preparatory activities to be followed by concrete proposals for the approval of the Commission. **The Executive Council emphasized** that this effort should be carried out in close collaboration with all UN Agencies, the UN Secretariat and competent NGOs.

7.2 REPORT ON THE UNITED NATIONS GENERAL ASSEMBLY (UNGA) OPEN-ENDED INFORMAL CONSULTATIVE PROCESS MEETING ON OCEAN AFFAIRS

412 The IOC Executive Secretary recalled that the Commission on Sustainable Development at its Seventh Session recommended that the UN General Assembly *"consider ways and means of enhancing the effectiveness of its annual debate on oceans and the law of the sea"* (CSD Decision 7/1. Oceans and Seas, 1999; Document E/1999/29, Section I. C). Consequently, the UN General Assembly adopted resolution 54/33 of 24 November 1999 establishing an open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS), in order to facilitate the annual review by the General Assembly, in an effective and constructive manner, of developments in ocean affairs by considering the Secretary-General's Report on Oceans and the Law of the Sea and by suggesting particular issues to be considered by it, with an emphasis on identifying areas where coordination and cooperation at the intergovernmental and inter-agency levels should be enhanced.

413 UNICPOLOS is expected to apply an integrated approach to ocean issues. Such an approach involves an overview of various sectors related to the oceans and seas, consideration of trans-sectoral issues, and most importantly, an integration of various relevant aspects of oceans and seas, including political, legal, economic, social, environmental, scientific and technical aspects. The UNICPOLOS meetings are planned to take place annually for an initial period of three years.

414 In its decision, the General Assembly underlined, in particular, the importance of the participation of ACC-SOCA in the consultative process and of its inputs to the report of the Secretary-General on Oceans and the Law of the Sea.

415 The first UNICPOLOS meeting was held in New York from 29 May - 2 June 2000 and was attended by the Chairperson and the Executive Secretary of IOC. The issues that were considered in the first UNICPOLOS meeting included: (i) Responsible Fisheries and Illegal, Unregulated and Unreported Fisheries: Moving from principles to implementation; and (ii) Economic and Social Impacts of Marine Pollution and Degradation, especially in Coastal Areas: International aspects of combating them.

416 At this meeting IOC received universal recognition as the focal point for Ocean Sciences in the UN system. Moreover, strong support was received for conducting an Ocean Science review in the second UNICPOLOS meeting which should take place in 2001.

417 **The Executive Council welcomed** the establishment of UNICPOLOS by UNGA, and noted that the process presents a unique opportunity for the Member States to give their concerted input regarding the future of IOC so that the Commission can play a crucial role as a focal point in Ocean Sciences in the UN System. **The Executive Council urged** Member States to attend the second UNICPOLOS meeting to be held in 2001 **and recognized** that the possible future issues that can be considered by the process should include, among others, sustainable ocean monitoring and regional cooperation and capacity building.

418 **The Executive Council adopted** Resolution EC-XXXIII.16.

8. MULTIDISCIPLINARY PROGRAMMES IN UNESCO AND FOLLOW-UP TO THE WORLD CONFERENCE ON SCIENCE

419 Dr I. Oliounine, IOC Consultant, introduced this Agenda item on cooperation within UNESCO, observing that there are inherent linkages and relationships; that there is a growing recognition among UNESCO's environmental and social, educational and cultural programmes; and that there is much to be gained from closer working relationships. Recent years have seen an extended cooperation between IOC, IHP, MAB (Man and the Biosphere) and the Education Sector in developing educational materials for schools, in formulating the storm surges proposal, and in planning cooperation under a new project on "Submarine Groundwater Discharges in the Coastal Zone".

420 He then focused attention on the results of the Consultative Planning meeting held in Nijnii Novgorod, Russian Federation, in May, 2000, with the participation of experts of IHP, MAB, MOST and Venice Regional Office of UNESCO, WMO, UNEP/GIWA and LOICZ. The meeting discussed cooperation in the development of a new project "Sustainable Development of Large River Basins: A demonstration project for the Volga and Caspian Sea Basin". The objective of the project will be "*the development of economical, legal, scientific, methodological and information means of the support to decision making, which will help to carry out effective management of the great river basins and coastal zones aiming to create ecologically secure living and health conditions for the population and natural environment*".

421 Dr A. Szöllözi-Naggy, Secretary of the International Hydrological Programme (IHP), told the Council about the objectives of the Fifth Phase of the IHP (1996-2001), one of which is on a

stimulation of a stronger inter-relation between scientific research, application and education. He then presented the basis of the Sixth Phase of IHP (2002-2007), the fundamental principle of which is that fresh water is as essential to sustainable development as it is to life, and that water, beyond its geophysical, chemical, biological function in the hydrological cycle, has social, economic and environmental values that are interlinked and mutually supportive.

422 Dr Szöllözi-Naggy described several areas where cooperation could well serve both the interests of IHP and IOC. These range from the integrated assessment of water resources in the context of global land-based activities and climate change up to the water problems of small islands and coastal zones. Cooperation in the integrated water management of endorheic basins has been started between IHP and IOC in the Caspian Sea Basin. IHP is looking forward to organizing other joint activities with IOC.

423 He then referred to the Second World Water Forum and Ministerial Conference, which was held in March 2000 in The Hague. As an outcome of the Forum, UNESCO is hosting the UN System-wide World Water Assessment Programme, leading among others to the publication of the biennial World Water Development Report.

424 Dr Szöllözi-Naggy concluded by expressing a wish to see close ties and cooperative programmes between IOC and IHP.

425 **The Executive Council noted** that the decision to formulate the project responds to the Joint Statement of the Chairperson of the Five UNESCO Scientific Programmes that was made to the 30th General Conference of UNESCO. They announced the need to develop joint demonstration projects in specific locations, like large river basins and coastal mega-cities, which lend themselves to an integrated approach from research and training to policy implementation.

426 **The Executive Council supported** the results of the Nijnii Novgorod meeting and its decision to start planning the demonstration project, **acknowledged** the readiness of the organizations and national institutions to cooperate and contribute to the development of the project proposal for the Volga and Caspian Sea Basin and **welcomed** the readiness of IHP to forge the ties of cooperation with IOC in this and other activities.

427 **The Executive Council thanked** the Secretary of IHP for his statement **and invited** the Executive Secretary to continue efforts in to extend existing and establish new linkages with other UNESCO sectors and programmes in areas of climate, coastal management, operational oceanography and capacity building.

428 Dr Bernal, IOC Executive Secretary, presented the results of the World Conference on Science, organized jointly by UNESCO and ICSU in Budapest, Hungary, from June 26 to July 1 1999. He referred to the two major documents endorsed in Budapest - the *Declaration on Science and the Use of Scientific Knowledge* and the *Science Agenda - Framework for Action*. He explained that these documents were endorsed by the 30th General Conference of UNESCO and the General Assembly of ICSU. The General Conference of UNESCO stressed the need of providing a significant and vigorous follow-up in order to assure that Member States and the Organization, as a whole, can benefit from such a large effort and investment.

429 The Executive Secretary confirmed that the IOC programme is well tuned to the priorities identified by the Conference, and significant contribution can be made by IOC to capacity building and addressing environmental issues. He emphasized that the capacity building is more

than just the transfer of knowledge or education; it is very much the transfer of know-how. We need to find ways to use science for the benefit of society in building institutions to deal with the marine-related problems and to inject science and technology achievements in the process of decision-making.

430 The Delegate of Canada noted that the small number of interventions on this item further demonstrated the lack of communication between the IOC and UNESCO communities within Member States.

431 **The Executive Council appreciated** the achievements of the Conference **and called on** the Executive Secretary to pursue the Commission activities using the *momentum* of the Conference. **The Executive Council noted** that the *Science Agenda* has implications for IOC activities at all levels, **and recognized** that the success of the Conference will depend on the capacity and good will of Member States to implement the recommendations of the Conference. **The Executive Council recommended** that there should be a clear plan of actions for follow-up to the Conference, **and invited** the Executive Secretary to take action accordingly.

9. PROGRAMME AND BUDGET FOR 2000-2001

432 The First Vice-Chair of IOC, Dr D, Pugh (UK) introduced this Agenda item, speaking as the Chairperson 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 dealt with transparency of the IOC budget process; adjustments to Regular Budget cuts; and the implementation of the expectation of an incompressible UNESCO contribution to the IOC through the Regular Budget. The Group had benefited from full and open discussions with the Executive Secretary and the Secretariat on project funding. It agreed that specific cuts would be necessary, rather than percentage cuts across all programmes and projects, and that advertisement of the pain caused by these cuts in terms of the activities that will be curtailed, would serve as an external indicator of the need for stable and enhanced IOC funding.

433 The subsequent cuts make clear that there is no unallocated money that can be allocated to any new initiatives that may be agreed by the Executive Council in its resolutions. Accordingly, the Group emphasized to the Executive Council that any new initiatives arising from this meeting of the Council would have to be supported by additional extra-budgetary resources, and that all costs associated with the resolutions should be considered in that category unless already included in the 2000-2001 IOC budget which had already been approved.

434 During the ensuing debate, many delegations stressed the need to get the appropriate funds for the IOC programmes and to develop a better communication between IOC and UNESCO delegations at the national level with a view to ensuring an increased budget for IOC.

435 **The Executive Council agreed** that prior to each UNESCO Executive Board and General Conference, IOC focal points and officers will be informed of IOC related issues to be addressed by these two bodies. This will allow IOC focal points to brief their UNESCO national delegations. This should be done through an eletronic circular letter sent well in advance of each meeting.

436 The Delegate of USA noted that his country has been able to contribute $600,000 this year, an increase over the $525,000 it contributed last year. He asked that the record show that every consideration should be given to covering the $50,000 cut allocated to the WCRP, so that

the IOC would be seen to be fulfilling - to the extent possible - its joint obligations to WMO and ICSU.

437 **The Executive Council adopted** Resolution EC-XXXIII.17 and Resolution EC-XXXIII.18.

10. ARRANGEMENTS FOR THE 34TH SESSION OF THE EXECUTIVE COUNCIL AND THE 21ST SESSION OF THE ASSEMBLY

438 The Executive Secretary reported on the arrangements for the sessions recalling the dates proposed during the last Assembly, *i.e.* the two-week period beginning on 2 July 2001, and informed the Executive Council of the difficulty on bringing those dates forward by one or two weeks because of clashes with the dates of the Executive Board of UNESCO, and the JCOMM Meeting.

439 **The Executive Council** agreed that the 21st Session of the Assembly should commence on Tuesday 3 July, immediately preceded on Monday 2 July by a session of the Executive Council. It was proposed that the 35th Session of the Executive Council should be held in the first two weeks of June 2002.

11. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT

440 Vice-Admiral M. Leal (Brazil), Second Vice-Chair and Chairperson of the Technical Resolutions Committee, presented a report on the proceedings of the Committee. He informed the Council that the Committee had held 7 sessions and examined 19 draft resolutions. He recommended that for future sessions the rules and guidelines described in document IOC/INF-734 rev. should be clearly followed. He invited Member States to submit draft resolutions in advance of the session, whenever possible.

441 **The Executive Council reviewed** the draft resolutions and the draft report. **The Executive Council adopted** the resolutions and the report as herein presented.

442 **The Executive Council agreed** that there was a need to standardize the way the summary report is written, insuring consistency in the terminology used. **The Executive Council recommended** that some guidelines be formulated to meet this need.

12. CLOSURE

443 The Chairperson closed the 33rd Session of the Executive Council at 13.00 on 30 June 2000.

444 Following a proposal from the delegates of Portugal, Mexico, Peru, and Pakistan, **the Executive Council decided** to send a message of congratulation to Prof. Agustín Ayala-Castañares on the occasion of the scientific seminar in tribute of his work, organized in Cuernavaca, 7-9 July 2000.

ANNEX I

AGENDA

1. OPENING

2. ORGANIZATION OF THE SESSION

2.1 Adoption of the Agenda
2.2 Designation of the Rapporteur
2.3 Establishment of Intrasessional Committees
2.4 Introduction of Timetable and Documentation
2.5 Roger Revelle Memorial Lecture

3. DEVELOPMENTS SINCE THE 20th SESSION OF THE IOC ASSEMBLY

3.1 Results of the 30th Session of UNESCO General Conference
3.2 Progress Report on the Programme and Budget Execution
3.3 Revision of the Rules of Procedure
3.4 External Evaluation Team Report

4. PROGRAMME MATTERS REQUIRING DECISIONS BY THE EXECUTIVE COUNCIL

4.1 Ocean Sciences
- 4.1.1 Oceans and Climate
- 4.1.2 Census of Marine Life
- 4.1.3 Harmful Algal Blooms (HAB) Programme
- 4.1.4 Marine Science Inputs to Integrated Coastal Area Management (ICAM)
- 4.1.5 Restructuring the Global Investigation of Pollution in the Marine Environment (GIPME) Programme and Strategic Plan
- 4.1.6 Review of the Framework of IOC's Existing Ocean Science Programmes
- 4.1.7 Large Marine Ecosystems

4.2 Ocean Services
- 4.2.1 Ocean Data Exchange Policy
- 4.2.2 Disaster Preparedness: Tsunami and Storm Surges
- 4.2.3 General Bathymetric Chart of the Oceans (GEBCO)

4.3 Operational Observing System
- 4.3.1 Global Ocean Observing System (GOOS) and Related Matters
- 4.3.2 Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)
- 4.3.3 Global Sea-level Observing System (GLOSS)
- 4.3.4 Global Climate Observing System (GCOS)

4.4 Regional Activities
- 4.4.1 IOC Regional Committee for the Central Indian Ocean (IOCINDIO)
- 4.4.2 IOC Regional Committee for the Central Eastern Atlantic (IOCEA)

4.4.3 IOC Regional Committee for the Cooperative Investigation in the North and Central Western Indian Ocean (IOCINCWIO)
4.4.4 Caspian Sea
4.4.5 Other Regions
4.4.6 Policy on Regional Programmes, Offices and Staffing

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

6. IMPLEMENTATION OF ACTIONS RELATED TO UNITED NATIONS (UN) CONVENTIONS

6.1 Progress on the International Ocean Assessment Report
6.2 IOC and the UN Convention on the Law of the Sea (UNCLOS)

7. COOPERATION WITH UN AND NON-GOVERNMENTAL ORGANIZATIONS

7.1 Report on the Administrative Committee on Coordination - Sub-Committee on Oceans and Coastal Areas (ACC-SOCA)
7.2 Report on the United Nations General Assembly (UNGA) Open-Ended Consultative Informal Process Meeting on Ocean Affairs

8. MULTIDISCIPLINARY PROGRAMMES IN UNESCO AND FOLLOW-UP TO THE WORLD CONFERENCE ON SCIENCE

9. PROGRAMME AND BUDGET FOR 2000-2001

10. ARRANGEMENTS FOR THE THIRTY FOURTH SESSION OF THE EXECUTIVE COUNCIL AND THE TWENTY-FIRST SESSION OF THE ASSEMBLY

11. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT

12. CLOSURE

ANNEX II

RESOLUTIONS

Resolution EC-XXXIII.1

MEDIUM-TERM STRATEGY OF UNESCO (31 C/4)

The Executive Council,

Bearing in mind that documentation is now being prepared on the development of the next Medium-Term Strategy of UNESCO (31 C/4) for presentation to the 160th Session Executive Board of UNESCO, and that a statement of IOC's strategy is therefore required for consideration by the UNESCO Governing Bodies,

Recognizing the expanded role of the Commission and the revision of its Statutes as approved by the 30th General Conference of UNESCO,

Recalling that the mission of the IOC is *"to promote international cooperation and to coordinate 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, sustainable development, the protection of the marine environment, and the decision making processes of its Member States"* (Art. 2.(1) of IOC Statutes),

Noting that the draft Medium-Term Strategy (31 C/4) is based, in part, on the need for UNESCO to strengthen inter-agency and interdisciplinary cooperation,

Decides to state that the strategic goals of IOC, to be implemented internally using existing mechanisms, are:

(i) to provide the essential framework for cooperation and leadership of intergovernmental cooperation in observing, understanding, predicting, and ultimately, protecting the world's oceans;

(ii) to enable UNESCO and its Member States to build on their initial investment in the scientific study of the oceans in the second half of the 20th century and benefit all humanity in the 21st century by providing the urgently needed global leadership in the development of physical, biological and chemical operational oceanographic services that will improve understanding of processes and forecasting of likely changes and their consequences;

Urges UNESCO to recognize the importance of the oceans in its next Medium-Term Strategy (31 C/4), and to accept, through the IOC, a leadership role for ocean science, related services, and capacity building, within the UN system and to recognize this by increasing its budget accordingly;

Urges Member States of UNESCO and IOC to strengthen their contribution to the work of the IOC through enhanced national and regional marine programmes and increased financial and other support for the international planning and implementation of marine activities, including through extra-budgetary funding and the secondment of expert staff to participate in the international planning and management process in both the IOC Secretariat and the Regional Offices.

Financial implications : none

Resolution EC-XXXIII.2

EXTERNAL EVALUATION TEAM REPORT

The Executive Council,

Noting with appreciation the initiative by UNESCO to conduct an independent evaluation of the IOC within the overall evaluation programme of UNESCO,

Recognizing the importance of this process to the further development of IOC in UNESCO as a body with functional autonomy,

Having taken the opportunity offered by UNESCO to consider the evaluation report and its findings,

Expresses its gratitude to the members of the Evaluation Team for the work done;

Invites the Director-General of UNESCO to transmit the Evaluation Report in its entirety as a working document of the UNESCO Executive Board;

Requests the Executive Board and General Conference of UNESCO to consider closely the main Recommendations of the Report and take necessary decisions to support the progressive development of the IOC;

Urges Member States to strengthen their contribution to the work of the IOC through enhanced national marine programmes and increased financial and other support for the international planning and implementation of marine activities; and especially through extra-budgetary funding and the secondment of expert staff to participate in the international planning and management processes in both the IOC Secretariat and the Regional Offices;

Instructs the IOC Executive Secretary to translate the main recommendations including those of the management of the Secretariat and related matters into a plan of action and to report on the progress achieved to the 21st Assembly of IOC.

Financial implications: none

Resolution EC-XXXIII.3

FIFTH SESSION OF THE IOC INTERGOVERNMENTAL PANEL ON HARMFUL ALGAL BLOOMS (IPHAB-V)

The Executive Council,

Having considered the Executive Summary and Report of the Fifth Session of the Panel together with the four Resolutions, seven Recommendations, and the Work Plan for 2000-2001 adopted at the Session (IOC/IPHAB-V/3),

Decides, subject to the availability of resources in the Regular Programme and the identified extra-budgetary resources:

(i) to accept the Report and Resolutions 1 to 4 therein,

(ii) to take action on the Recommendations as follows:

Recommendation IPHAB-V.1 - Staffing of the HAB Programme Office

(i) **to approve** the Recommendation;

(ii) **urges** Denmark and the USA to maintain their staff support for the OSLR and HAB Programme, and invites other Member States to consider the possibility of pooling resources for an additional post specifically for HAB;

Recommendation IPHAB-V.2 - Development of GEOHAB

(i) **to approve** the Recommendation;

Recommendation IPHAB-V.3 - Implementation of HAB Monitoring within the Global Ocean Observing System

(i) **to approve** the Recommendation;

Recommendation IPHAB-V.4 - ICES-IOC Working Group on the Dynamics of Harmful Algal Blooms (WGHABD)

(i) **to approve** the Recommendation;

RECOMMENDATION IPHAB-V.5 - COMPATIBILITY OF REGULATIONS ON AQUATIC BIOTOXINS

(i) **to approve** the Recommendation;

RECOMMENDATION IPHAB-V.6 - HABP WORK PLAN 2000-2001

(i) **to approve** the Recommendation;

Recommendation IPHAB-V.7 - Operation of the IOC Intergovernmental Panel on Harmful Algal Blooms

(i) **to approve** the Recommendation;

(ii) **instructs** the IOC Executive Secretary to convene the Sixth Session of the IOC IPHAB prior to the 35th Session of the IOC Executive Council;

(iii) **instructs** the IPHAB to provide an executive summary of its report, with a proposed resolution for possible action, including an estimate of financial implications to the 35th Session of the IOC Executive Council.

Financial implications: see Annex

Annex to Resolution EC-XXXIII.3

Summary of Budgetary Implications for the Biennium 2000-2001 (in USD)

ACTIVITY: (see IPHAB Work Plan)	A. Total financial implication of IPHAB-V Resolutions and Recommendations	B. Estimated available funds (Regular Programme and general Trust Fund)	C. Expected extra-budgetary contributions specifically for HAB	D. Required additional extrabudgetary contributions for full programme implementation [A-(B+C)]
PROGRAMME SUPPORT General Staff IOC HAB Science and Communication Centres	 20.000 2 seconded 360.000	 10.000	 1,5 seconded 360.000	 10.000 0,5 seconded
EDUCATIONAL ELEMENTS *Training (TEMA)* Publications	 *335.000* 75.000	 *95.000* 40.000	 *240.000*	 *35.000*
SCIENTIFIC ELEMENTS (INCL. REGIONAL COMPONENTS)	290.000	90.000		200.000
OPERATIONAL ELEMENTS	15.000	15.000		
TOTAL	**1.095.000**	**250.000**	**600.000**	**245.000**

Resolution EC-XXXIII.4

IOC OCEANOGRAPHIC DATA EXCHANGE POLICY

The Executive Council,

Recalling IOC Resolution XX.11 on Oceanographic Data Exchange Policy,

Emphasizing that full and open sharing of a wide spectrum of global international data sets for ocean programmes is a fundamental objective for the IOC,

Noting with appreciation the success of the existing principles of "full and open" exchange of oceanographic data and information as applied by the IOC and its IODE during the past 40 years and the successful cooperation with ICSU's World Data Centre system,

Having considered the report of the *ad hoc* Working Group on Oceanographic Data Exchange Policy in general and the 'Draft IOC Data Policy Statement' in particular, as contained in Document IOC/INF-1144,

Recalling:

(i) WMO Resolution 40 (Cg-XII) dealing with the international exchange of meteorological and related data and products, and Resolution 25 (Cg-XIII) covering hydrological data and products,

(ii) the *IOC 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),

Considering the need for an IOC Oceanographic Data Exchange policy that will enhance implementation of the IOC programmes and will improve further cooperation among Member States,

Considering further the need, in view of JCOMM and other IOC/WMO joint activities, for an IOC Oceanographic Data Exchange Policy that is compatible with WMO's Policy for the International Exchange of Meteorological and related data and products,

Decides to establish an intersessional Intergovernmental Working Group on IOC Oceanographic Data Exchange Policy with Terms of Reference as detailed in the Annex to this Resolution;

Urges Member States of the Executive Council, interested in participating in the work of the Group, to inform the Secretariat of the names of their governmental expert(s) designated to discharge this task;

Urges Member States to provide in-kind support and/or financial contributions to the IOC Trust Fund to cover the costs of the meetings of the Intergovernmental Working Group.

Financial implications: US$100,000 (2001-2002) from extra-budgetary sources

Annex to Resolution EC-XXXIII.4

Terms of Reference for the Intergovernmental Working Group on IOC Oceanographic Data Exchange Policy

1. Purpose

As a further step towards an IOC Oceanographic Data Exchange Policy:

To continue detailed discussions and assessments of 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 IOC Assembly:

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

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

(c) a draft resolution for consideration by the Assembly.

2. Implementation

In pursuit of its task the Working Group shall:

(a) request all IOC Subsidiary, Technical and Regional Bodies for guidance with regard to IOC's Oceanographic Data Exchange Policy, with special attention to assessing the implications that adopting any proposed changes to the current policy may have on the effectiveness of their programmes;

(b) consult with WMO, ICSU and other appropriate organizations and programmes;

(c) give special attention to legal implications.

3. Composition

The intersessional Intergovernmental Working Group shall be open for participation to all Member States of the IOC Executive Council. The Working Group shall be headed by a Chairperson appointed by the Executive Council.

4. Financial implications

At least two meetings of the Working Group shall need to be organized. Standard costs of such meetings are estimated at not less than US$ 50,000/meeting (including translation and interpretation, secretarial cost, 40 participants). Additional allocations may be necessary to support participation of developing countries.

Resolution EC-XXXIII.5

INTERNATIONAL COORDINATION GROUP FOR THE TSUNAMI WARNING SYSTEM IN THE PACIFIC

The Executive Council,

Reiterating the importance of the IOC Tsunami Programme for saving lives and property and for meeting objectives of the International Strategy for Disaster Reduction,

Considering the Summary Report and Recommendations of the 17th Session of the International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) held in Seoul, Republic of Korea, 4 - 7 October 1999, and the progress achieved by the Group in the implementation of the ITSU Programme,

Noting the interest of Member States from other geographical areas outside the Pacific, especially from the Caribbean Basin,

Endorses the Summary Report **and approves** the Recommendations of ITSU-XVII;

Stresses the importance of the International Tsunami Information Centre (ITIC) in implementing the Tsunami Programme in the Pacific **and requests** the Chairperson ICG/ITSU jointly with the ITIC Director to increase the effectiveness of ITIC;

Recommends that the experience gained by the ICG/ITSU in the Pacific be freely, and at no cost, shared with the Caribbean region and that the Workshop on the "IAS Project on the Development of the Tsunami Warning System in the Caribbean" be arranged with the participation of experts from the Pacific and Caribbean regions well in advance of the next session of the ICG/ITSU planned for 2001;

Instructs the IOC Executive Secretary to consider ways to secure the necessary funding for the effective execution of the Tsunami Programme in the Pacific and for the new developments related to the tsunami warning system in the Caribbean region;

Encourages Member States, particularly those concerned with the tsunami threat, to contribute to the IOC Trust Fund in order to ensure the successful development of the tsunami warning systems in all IOC regions as requested.

Financial implications: US$40,000 in 2001 (US$15,000 from Regular Programme)
(US$25,000 from extra-budgetary sources)

Resolution EC-XXXIII.6

STORM SURGES PROJECT PROPOSAL

The Executive Council,

Recognizing that project proposal on storm surges disasters reduction in the northern part of the Indian Ocean constitutes an important contribution of IOC to the International Strategy on Disaster Reduction (ISDR) objectives in the area of saving human lives and property caused by natural disasters,

Recalling Resolution EC-XXXI.3 by which the Executive Council decided to support the project proposal and to encourage close liaison between the organizations and Member States concerned in getting support from funding agencies for the project implementation,

Appreciating the efforts made by WMO and IHP of UNESCO in support of the project and of India in promoting the objectives of the project in the region,

Noting with satisfaction the decisions of the regional meeting held in New Delhi, 22-26 October 1999, at which the organizations and Member States concerned developed the strategy for the project implementation as presented in Document IOC/EC-XXXIII/2 Annex 6,

Considering further the recommendations of the IOCINDIO-III regional meeting (21-23 February 2000 in Tehran); the 27th Session of the WMO/ESCAP Panel on Tropical Cyclone (27 February-4 March 2000 in Muscat); and the presentation on the progress on project implementation made by the Chairpeson IOCINDIO at the 33rd Executive Council Meeting,

Requests the IOC Executive Secretary to take the following steps urgently for implementation of the project in consultation with WMO and IHP of UNESCO by:

(i) establishing a WMO-IOC-IHP Storm Surges Regional Project Office in New Delhi for the management of the project by WMO, IOC and IHP;

(ii) identifying and assigning tasks to be undertaken by Member States and the Regional Project Office;

(iii) urging the Member States to speed up the compilation of all governmental procedures for implementing the project tasks, raise necessary funds, and be responsible for executing the tasks assigned to them;

(iv) assisting the Regional Project Office to raise necessary funds for executing the tasks assigned to it.

Financial implications: US$15,000 (US$7,500 from Regular Programme)
(US$7,500 from extra-budgetary sources)

Resolution EC-XXXIII.7

GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)

The Executive Council,

Recalling that IOC Resolutions XVIII-10 (1995), XIX-3 (1997) and XX-5 (1999) emphasised the high importance of Ocean Mapping to all IOC Member States as well as to global and regional science programmes, such as climate programmes, ICAM, tsunamis and storm surges,

Noting with satisfaction:

(i) the close cooperation in Ocean Mapping, especially GEBCO, with the International Hydrographic Organization (IHO), the importance of mapping data from the IOC International Bathymetric Chart series and the numerous significant contributions for updated bathymetry thoughout the world's oceans,

(ii) the continued success of the second release of the GEBCO Digital Atlas (GDA) and the plans for the updating and inclusion of gridded contours for the third release of the GDA (planned for 2001),

Taking note of:

(i) the findings of the SCOR Working Group 107 and in particular the stated needs of the scientific community for high resolution grids of the bathymetry of the ocean floor,

(ii) the need for extensive updating of the world´s bathymetry and of the Pacific Ocean and Arctic Ocean in particular,

(iii) the requirement to develop the technology of the GDA and make optimum use of emerging information technologies,

(iv) the need to create a new 6th edition of the GDA by print-on-demand technology,

Considering that at present GEBCO depends on limited IOC funding, UK funding for salaries, IHO (non-financial) sponsorship, part-time participation of numerous organizations, substantial voluntary contributions from the scientific communities and hydrographic offices,

Invites Member States:

(i) to support the determination of the morphology of the ocean floor especially in those areas of scientific and commercial importance as identified by SCOR/IOC;

(ii) to assemble, collate and contour such areas so as to contribute to the improvement of the global charts of GEBCO;

(iii) to take into account all other relevant geological, geophysical and satellite data to aid in interpolation and interpretation;

(iv) to generate and make available to the GEBCO global grid, gridded and/or contoured data of their continental margins if appropriate;

(v) to support financially the GEBCO Centenary Conference on ocean floor mapping to be held in Monaco in April 2003;

(vi) to consider and support the GEBCO proposal to prepare an educational GEBCO CD-ROM for wide distribution to schools and Universities;

(vii) to consider creating and supporting GEBCO Centenary Fellowships to enable well qualified geoscientists to accelerate the updating of global bathymetry;

Instructs the IOC Executive Secretary to provide support towards the GEBCO Centenary Conference, the printing of the 6th edition of the GDA and partial support of a GEBCO Centenary Fellowship.

Financial implications: US$20,000 from extra-budgetary sources

Resolution EC-XXXIII.8

DATA BUOY COOPERATION PANEL

The Executive Council,

Noting:

(i) IOC Resolution XVII.6 – Data Buoy Cooperation Panel,

(ii) WMO Resolution 9 (EC-XLV) – Data Buoy Cooperation Panel,

(iii) IOC Resolution XX.12 – Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM),

(iv) WMO Resolution 14 (Cg-XIII) – Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM),

(v) WMO Resolution XX (EC-LII) - Data Buoy Cooperation Panel,

(vi) Final Report, DBCP-XIV, paragraph 7.3, and Annex VI,

Noting further the decision by the Assembly and WMO Congress "*that JCOMM will become the reporting and coordinating mechanism for the DBCP….*",

Recognizing that this decision necessitates some small modifications to the terms of reference of the DBCP,

Decides that the terms of reference for the Data Buoy Cooperation Panel and for its Technical Coordinator should be as given in the Annex to this Resolution;
Requests the IOC Executive Secretary to continue to provide the necessary secretariat support to the Panel, within the available budgetary resources.

Note: This Resolution replaces IOC Resolution XVII.6, which is no longer in force.

Financial implications: none.

Annex to Resolution EC-XXXIII.8

Data Buoy Cooperation Panel

PART A

Terms of Reference for the Data Buoy Cooperation Panel

The Data Buoy Cooperation Panel shall:

1. Consider the expressed needs of the international meteorological and oceanographic communities for real-time or archival data from ocean-data buoys on the high seas and request action from its members, the Technical Coordinator or action groups to meet these needs;
2. Coordinate activity on existing programmes so as to optimize the provision and timely receipt of good quality data from them;
3. Propose, organize and implement, through the coordination of national contributions, the expansion of existing programmes or the creation of new ones to supply such data;
4. Support and organize as appropriate such action groups as may be necessary to implement the deployment of data gathering buoys to meet the expressed needs of oceanographic and meteorological programmes such as WWW, WCRP, GOOS and GCOS;
5. Encourage the initiation of national contributions to data buoy programmes from countries which do not make them;
6. Promote the insertion of all available and appropriate buoy data into the Global Telecommunication System;
7. Promote the exchange of information on data buoy activities and encourage the development and transfer of appropriate technology;
8. Ensure that other bodies actively involved in buoy use are informed of the workings of the panel and encourage, as appropriate, their participation in the panel deliberations;
9. Make and regularly review arrangements to secure the services of a Technical Coordinator with the terms of reference given in Part B;
10. Report formally to the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), and participate in and contribute to an integrated global operational ocean observing system, implemented and coordinated through JCOMM;
11. Submit annually to the Executive Councils of the WMO and the IOC, to JCOMM and to other appropriate bodies of WMO and IOC, a report which shall include summaries of the existing and planned buoy deployments and data flow.

PART B

Terms of Reference for the Technical Coordinator of the Data Buoy Cooperation Panel

The Technical Coordinator of the Data Buoy Cooperation Panel shall:

1. Under the direction of the Data Buoy Cooperation Panel take all possible steps within the competence of the panel to assist in the successful achievement of its aims;
2. Assist in the development, implementation and management of quality control procedures for data buoy systems;
3. Assist in setting up suitable arrangements for notifying the appropriate user communities of changes in the functional status of operational buoys;
4. Assist in the standardization of buoy data formats, sensor accuracy, etc.;
5. Assist when requested with the development of cooperative arrangements for buoy deployment;
6. Assist in the clarification and resolution of issues between Service Argos and buoy operators;
7. Assist in promoting the insertion of all available and appropriate buoy data into the Global Telecommunication System;
8. Supply information about buoy developments and applications to the WMO and IOC Secretariats and assist the Data Buoy Cooperation Panel to promote an international dialogue between oceanographers and meteorologists;
9. Coordinate and monitor the flow of buoy data into appropriate permanent archives.

Resolution EC-XXXIII.9

GLOBAL SEA LEVEL OBSERVING SYSTEM

The Executive Council,

Noting Resolution XX-12 of the summary report of the IOC Assembly regarding the establishment of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) and that the Global Sea Level Observing System (GLOSS) should report to JCOMM,

Recognizing that new terms of reference for GLOSS (as proposed in Annex 1) would therefore be necessary,

Recalling the approval and adoption by the 20th IOC Assembly of the report of the 6th Session of the GLOSS Group of Experts which recommended the establishment of a Scientific Sub-Group (SSG) on sea level to provide scientific advice to the wider community,

Noting that the proposed terms of reference for the GLOSS Group of Experts (Annex 1) and the SSG (Annex 2) had been circulated to the GLOSS Group of Experts and approved, the latter also circulated to the chairs of other relevant bodies concerned with sea level change,

Approves:

(i) the modified terms of reference for GLOSS as provided in Annex 1;

(ii) the proposed terms of reference for the Scientific Sub-Group of the GLOSS Group of Experts as provided in Annex 2.

Financial implications: none

Annex 1 to Resolution EC-XXXlll. 9

Proposed New Terms of Reference for the GLOSS Group of Experts

(i) Advise JCOMM on the implementation of the GLOSS System, at global and regional levels;
(ii) Work closely with the GSC and its subsidiary bodies on the integration of GLOSS into GOOS;
(iii) Update the GLOSS Implementation Plan regularly;
(iv) Ensure proper liaison with international research programmes and relevant international organizations;
(v) Provide advice on the development of TEMA components of GLOSS, regarding training of specialists, provision of instruments, their installation and maintenance, data evaluation and interpretation;
(vi) Report periodically to the IOC Governing Bodies and to JCOMM.

Annex 2 to Resolution EC-XXXlll. 9

Proposed Terms of Reference for the Scientific Sub-Group of GLOSS

(i) Provide the GLOSS Group of Experts and other interested relevant bodies, *via* the Chairperson of the GGE, with general scientific advice on matters pertaining to the implementation of the monitoring of global and regional sea level change within the GLOSS programme, particularly with regard to climate change aspects;
(ii) Undertake specific studies pertaining to the effective monitoring of global sea level changes on matters requested by the Chairperson of the GGE;
(iii) Provide assistance as requested to the Chairperson of the GGE in the construction of Science and Implementation Plans for GLOSS;
(iv) Provide, through its scientific membership, links to other relevant bodies concerned with sea level change including OOPC, CLIVAR/UOP, IAPSO/CMSLT and C-GOOS and report implications to the GGE.

Resolution EC-XXXIII.10

GLOBAL CLIMATE OBSERVING SYSTEM

The Executive Council,

Noting:

(i) recent Decisions (4/CP.5 and 5/CP.5) of the Fifth Session of the Conference of Parties to the UN Framework Convention on the Climate Change (Bonn, 1999), and

(ii) conclusions of the recent Informal Meeting on Developing an Intergovernmental Process for GCOS (Toronto, Canada, February 2000),

Recognizing:

(i) the close and productive linkage between the Global Ocean Observing System and the Global Climate Observing System, demonstrated in particular by the fact that the ocean component of GCOS and the climate component of GOOS are one and the same,

(ii) that the UNFCCC Conference of the Parties (COP) provides an important mechanism through which Member States can address deficiencies in the observing systems required to meet their commitments to the Convention,

(iii) that, in view of the November 2001 deadline for reporting to the UNFCCC-COP, Member States need to start now to prepare reports on their activities in relation to systematic observation for inclusion in the next national communications to the UNFCCC-COP,

(iv) that there is a need for full coordination also at the national level to ensure balanced development of national observing systems for climate,

Decides that the inter-agency arrangements for coordination of systematic observations of the climate system should be further strengthened in view of the increasing interest and involvement of governments and, *inter alia*, the need for integrating both surface and space-based observation,

Urges Member States to:

(i) ensure that their delegations to sessions of the UNFCCC-COP and its subsidiary bodies are properly informed of the key role played by oceanographic agencies in implementing and operating observing systems necessary to meet national obligations under the Convention; and to take steps to provide appropriate scientific advice to national delegations through the inclusion therein of representatives of such agencies;

(ii) cooperate, where ever possible, in the development of regionally-based action plans that address deficiencies in observing systems for climate and in the presentation of these plans to potential funding agencies, including the GEF, for their consideration;

(iii) ensure that oceanographic communities in Member States actively participate in the preparation of their detailed reports and national communications to the UNFCCC due in November 2001;

(iv) actively support implementation of national oceanographic observing systems as elements of the Global Climate Observing System and Global Ocean Observing System networks and to support, to the extent possible, an increase in the number of ocean observations, particularly in remote locations; and the establishment and maintenance of reference stations, within the context of GCOS and GOOS plans;

(v) actively support the building of capacity in developing countries to enable them to collect, exchange and utilize data to meet local, regional and international needs;

(vi) consider how they might provide additional project resources for the implementation of the global ocean observing system for climate and the need for resources in the GCOS and GOOS Secretariats to coordinate these implementations;

Instructs the IOC Executive Secretary to:

(i) consult with the other GCOS sponsoring agencies to develop effective strategies to implement GCOS, including common resolutions, and to strengthen senior operational and governmental involvement in GCOS;

(ii) inform Member States of the urgent need to commence preparation of material for inclusion in national reports and communications to the COP on their contribution to systematic observation;

(iii) advise developing country Members about the potential availability of funding from the Global Environment Facility to assist them in preparing their reports to UNFCCC-COP;

(iv) and, within available budgetary resources, continue to support the planning, development and implementation of GCOS through financial support to the operation of the GOOS and GCOS Secretariats;

Financial implications: US$20,000 per year from extra-budgetary sources

Resolution EC-XXXIII.11

THIRD SESSION OF THE IOC COMMITTEE FOR THE CENTRAL INDIAN OCEAN (IOCINDIO-III)

The Executive Council,

Recalling the successful implementation of the IOCINDIO-II Programme of Work during the past intersessional period 1996-1999,

Noting with satisfaction the amount of training activities that have been carried out, and **thanking** the various donors (and) agencies for their financial and in-kind assistance,

Having considered the Executive Summary of the Third Session of the IOC Regional Committee for the Central Indian Ocean, together with the two Recommendations adopted during the Session,

Appreciates the contribution of the Government of the Islamic Republic of Iran in hosting the Third Session of IOCINDIO;

Decides to take the following actions on:

Recommendation IOCINDIO-III.1 - Programme of Work and Budget Estimate for 2000-2002

(i) **Approves** the Recommendation and its Annex subject to the availability of resources;

(ii) **Urges** Member States of the region to participate in and support the implementation of the regional cooperation programme to the best of their interest and capabilities;

(iii) **Urges** donor agencies, organizations and national institutions to actively communicate, coordinate and collaborate with the IOC, IOCINDIO and Member States to achieve the highest level of complementarity and coordination.

Recommendation IOCINDIO-III.2 - Storm Surge Project

(i) **Approves** the Recommendation subject to the availability of resources;

(ii) **Urges** concerned Member States to contribute to the project implementation within the context of government policies;

(iii) **Urges** the IOC Executive Secretary to bring this recommendation to the IOC and IOCINDIO focal points in the concerned countries and to the Heads of WMO and IHP of UNESCO, and the UNEP Regional Seas Programme through ROPME.

Financial implications: US$165,000 (US$80,000 from Regular Programme)
(US$85,000 from extra-budgetary sources)

Note: Financial implications for Recommendation IOCINDIO-III.2 are mentioned under Resolution EC-XXXIII.6

Annex to Recommendation IOCINDIO-III-1 – Work plan 2000-2001

Activities	**Action and objectives**	**Date and Place**	**Estimated Budget (US$)**	**Participation**	**Remarks**
I. Sea Level Network Training Course on GLOSS	Training in use of modern instruments; To achieve uniformity in data acquisition in the IOCINDIO Network.	2000-2001	Maximum 30,000	All countries	Approved by IOC Assembly Resolution XX-16
II. Integrated Coastal Area Management					
1) Preparation of Strategic ICAM Action Plan (SAP)	To hire a consultant to collect information and inputs from Member States and other resources with a view to provide a regional synthesis on ICAM and prepare a draft proposal	2000	10,000	All countries	
2) Regional Meeting on SAP	To discuss and approve SAP and identify pilot projects	2001	15,000	Interested countries	
II. ICAM *(cont'd)*					
3) MAMCOMP	To support participants to attend the	2000	25,000	Interested countries	

Activities	**Action and objectives**	**Date and Place**	**Estimated Budget (US$)**	**Participation**	**Remarks**
Training Course and Symposium on Coastal Cities and ICAM 4) ESCAP Bay Programme, Sri Lanka	MAMCOMP course and coastal cities Symposium To provide technical assistance for a planning meeting, in collaboration with IOMAC	2000-2001	5,000	Sri Lanka	
III. MARINE LIVING RESOURCES 1) Training Course on HAB Taxonomy 2) Coral Reef Monitoring Course/Workshop	Training regional scientists in HAB identification and taxonomy Training in monitoring techniques	2001 2000-2001 Persian Gulf	20,000 15,000 GCRMN, ROPME	Interested countries	Approved by IOCINDIO -II Approved by IOCINDIO -II
IV. MARINE POLLUTION 1) Workshop on Oil Spill Trajectory Modelling 2) Forecasting for Marine Pollution in the Persian Gulf	To adapt and finalize the NOAA Model in collaboration with ROPME To support a resource person to undertake a Feasibility Study	2000 Persian Gulf 2000 Persian Gulf	5,000 (IOC) 5,000	Interested countries Interested Member States	
V. TEMA IOCINDIO Intersessional Meeting of *Ad hoc* Group on TEMA	Meeting of a group of experts	2000 June, Paris Prior to the 33rd EC	5,000		
VI. IOCINDIO-IV	Meeting of the regional committee	2003	30,000	All Member States	
TOTAL REQUESTED		**2000-2003**	**165,000**		

Resolution EC-XXXIII.12

THE FIFTH SESSION OF THE IOC REGIONAL COMMITTEE FOR THE CENTRAL EASTERN ATLANTIC (IOCEA-V)

The Executive Council,

Noting with satisfaction the efforts of the IOC Secretariat for organizing the 5th Session of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA-V), 5-11 May 2000, Dakar, Senegal,

Expressing its appreciation to the Government of Senegal for hosting IOCEA-V,

Accepts the Executive Summary Report of the 5th Session of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA-V) together with its IOCEA-V *Declaration on Oceanographic Data Exchange Policy*, the Recommendations adopted by the Session, with the annexed programme of work;

Decides to approve the four recommendations of IOCEA-V and take the following actions:

IOCEA-V *Declaration on Oceanographic Data Exchange Policy*

Takes note of the IOCEA-V Declaration on Oceanographic Data Exchange Policy in line with UNESCO and IOC principles on sharing of knowledge and information;

Recommendation IOCEA-V.1 - Coordination and strengthening of IOC activities in the IOCEA region

Requests the Executive Secretary IOC to:

(i) **appoint** a Technical Secretary to be responsible for liaison at IOC Headquarters with the Member States and the regional officers;

(ii) **facilitate** the establishment of a Regional Office for the IOCEA region.

Recommendation IOCEA-V. 2 - Follow-up to PACSICOM and the African Process

(i) **Urges** the Executive Secretary, in collaboration with the Priority Africa Department, to mobilise the support of all other sectors of UNESCO in order to ensure the follow-up to the UNESCO technical workshops within the framework of the African Process;

(ii) **Exhorts** Member States to designate their focal points as soon as possible in order to facilitate the coordination of the programmed activities.

Recommendation IOCEA-V. 3 - Strengthening and development of the Large Marine Ecosystems projects of the IOCEA region

(i) **Encourages** the Executive Secretary:

(a) to work with other parts of the United Nations System, in particular GEF, UNDP, UNEP, FAO, UNIDO, the World Bank and other development partners in support of the second phase of the GEF/UNIDO/LME-Gulf of Guinea project;

(b) to take the necessary steps with the participating States of the Large Marine Ecosystem of the Canary Current and their development partners, for the prompt re-launching of the preparatory project and the mobilisation of the funds necessary for its implementation based on regional experience;

(ii) **Further requests** Member States and other international specialised agencies and regional institutions to support the initiatives in progress to accelerate the implementation of the Large Marine Ecosystem of the Benguela Current project.

Recommendation IOCEA-V.4 - Partnership between IOC and African regional institutions for the long-term development of oceanography and marine science in the IOCEA region

(i) **Requests** the Executive Secretary IOC to:

(a) take the necessary steps to associate relevant African regional organizations with IOC activities;

(b) seek the necessary funds for the execution of the Programme of Work of the present session;

(c) encourage the use of national and regional expertise;

(d) treat training and institutional support as priorities in order to enhance the capacities of the States of the region;

(e) strengthen the UNESCO Chairs in Oceanography, the Environment and Science and Technology in the IOCEA region through the UNESCO UNITWIN network;

(f) facilitate the organization in the IOCEA region, during the intersessional period of 2000-2001, of an international scientific symposium with a view to exchanging and sharing results stemming from the various projects and research in the region.

Financial Implications: US$300,000 for 3 years (US$60,000 from Regular Programme)
(US$90,000 from Trust Fund)
(US$150,000 from extra-budgetary sources)

Annex to Resolution EC-XXXIII.12

Summary of project plans (in US$):

Activities (Venue and dates)	Estimated cost and priority	Implementing institution country-participants	Potential programme collaborators/partners
Non-Living resources			
• Monograph on the typology of the Western African Coasts (2001)	10,000 high priority	IOC/IOCEA Member States	IOC, UNIDO/LME-GOG, regional institutions, (WAMU, ADB, OAU/CSTR, WADB)
• Second IOCEA Cruise in the Gulf of Guinea (2001) (preceded a coordination meeting for the cruise, (early 2001)	40, 000 High priority	IOC/IOCEA Member States	IOC, UNIDO/LME-GOG, regional institutions, (WAMU, ADB, OAU/CSTR, WADB)
• Instalation of tide gauges to support GLOSS network	5,000 High priority	IOC/IOCEA Member States	IOC, UNIDO/LME-GOG, regional institutions, (WAMU, ADB, OAU/CSTR, WADB)

Activities (Venue and dates)	Estimated cost and priority	Implementing institution country-participants	Potential programme collaborators/partners
Capacity Building • Remote sensing application (2001) in the region • Assistance in the establishment of a degree course in oceanography at the University of Lagos, Nigeria (2001) • UNESCO Chairs and UNITWIN in the IOCEA • Floating University	50,000 High priority	IOC/IOCEA Member States	As above
Sustainable management of marine resources and the protection of biodiversity in the IOCEA region • Implementation of a strategy for the preservation of large marine ecosystems • Definition of marine reserves and restoration of biodiversity • Application of the principles and practices of integrated coastal area management • Development of a sustainable aquaculture system • Application of principles and methods for responsible aquaculture and fisheries	50,000 Very high priority	IOC/IOCEA Member States	IOC, UNIDO/LME-GOG, regional institutions, (WAMU, ADB, OAU/CSTR, WADB, …); World Bank, GEF, UNEP, UNDP, FAO, IMO, IAEA-Monaco, IUCN, WWF, NOAA, SIDA/SAREC, IOI, IRD, IFREMER, international organizations, international scientific research institutions, European Union, bilateral partners, NGOs, SIAT, BENEFIT, PIRATA, GOOS-AFRICA, UNCLOS, LOICZ, GLOSS, IBCEA, ODINAFRICA-II
Ocean dynamics and their impact on coastal processes in the IOCEA region • Monitoring of coastal erosion and sea-level data • Data collection on river flows and coastal sediment fluxes • Modelling of ocean and coastal processes	50,000 Very high priority	IOC/IOCEA Member States	As above

Activities (Venue and dates)	Estimated cost and priority	Implementing institution country-participants	Potential programme collaborators/partners
Marine and coastal pollution in the IOCEA region • Development of a programme of sensitisation and education on the management of marine and urban-origin debris in the IOCEA region • Coordination with the activities of the LME-GOG project • Establishment of a network for data collection on marine pollution. • Establishment of a network for data collection on pollution of urban origin	50,000 Very high priority	IOC/IOCEA Member States	UNIDO/LME-GOG, regional institutions, (WAMU, ADB, OAU/ CSTR, WADB, …); World Bank, GEF, UNEP, UNDP, FAO, IMO, IAEA-Monaco, IUCN, WWF, NOAA, SIDA/SAREC, IOI, IRD, IFREMER, international organisations, international scientific research institutions, European Union, bilateral partners, NGOs, SIAT, BENEFIT, PIRATA, GOOS-AFRICA, UNCLOS, LOICZ, GLOSS, IBCEA, ODINAFRICA-II
Workshops on the identification of projects on each subject and for GOOS-AFRICA	20,000 Very high priority		As above
IOC/GEF/World Bank/ UNDP/UNEP Workshop on GEF project cycles.	25,000 Very high priority	IOC Member States	As above
Follow up of the ODINAFRICA-II and RECOSCIX-CEA	Very high priority (funded by Flanders)		IOC Member States
TOTAL	**300,000**		

Resolution EC-XXXIII.13

AFRICAN CONCERNS

The Executive Council,

Recalling:

(i) decisions (paragraphs: 02240 and 02241 in UNESCO Programme and Budget 2000-2001; doc. 30 C/5) of the 30th Session of the General Conference of UNESCO,

(ii) Resolutions XX-17, XX-20 and XX-21 of the 20th Session of the IOC Assembly respectively on IOCEA, PACSICOM and Priority Africa,

Recognizing that Africa has been declared a priority within UNESCO,

Noting with satisfaction:

(i) the acceptance by the IOCEA-V Session in Dakar of the offer of Nigeria to host the IOCEA Regional Office in Lagos,

(ii) that the Regional Office in the IOCINCWIO region is playing an effective coordinating role for IOC programmes and projects in the IOCINCWIO region,

(iii) the implementation of the RECOSCIX-WIO and ODINAFRICA-I in the IOCINCWIO region,

(iv) the First ODINAFRICA-II Planning Workshop and the efforts of IOC to secure trust funds to support the implementation of this project,

Noting also that:

(i) Resolutions XX-17 and XX-21 of the 20th Session of the IOC Assembly have not been substantially implemented,

(ii) the priority status of Africa within UNESCO is still relevant,

Requests the Executive Secretary IOC to:

(i) fully implement Resolutions XX-17, XX-20 and XX-21 of the 20th Session of the IOC Assembly and the decisions (paragraphs: 02240 and 02241 in doc. 30 C/5) of the 30th Session of the General Conference of UNESCO;

(ii) continue to identify funds to ensure sufficient budgetary allocation for Africa commensurate with its priority status in UNESCO for IOC programmes and activities in Africa, including the follow-up to the PACSICOM process;

(iii) facilitate the establishment of the IOCEA Regional Office, with the terms of reference annexed to this Resolution.

Financial implications: US$470,000 (US$20,000 from Regular Programme)
(US$40,000 from Trust Fund)
(US$410,000 from extra-budgetary sources)

Note: Financial implications for the establishment of the IOCEA Regional Office are covered under Resolution EC-XXXIII.12.

Annex to Resolution EC-XXXIII.13

Terms of Reference of the IOCEA Regional Office

Purpose

The purpose of the IOCEA Regional Office is to coordinate, facilitate and monitor implementation of IOC programme activities and projects in the Region.

Functions of the Regional Office are to:

(i) assist in the coordination and implementation of IOCEA programme of activities, work plans and projects;
(ii) monitor the progress of implementation of IOCEA programme of activities, work plans and projects and to report to the IOCEA Chairperson and the IOC Executive Secretary;
(iii) assist in the planning and organization of meetings, workshops, training courses, and other capacity building activities;
(iv) advise and assist IOCEA Member States with formulation of project proposals;
(v) liaise and maintain links with IOC programmes;
(vi) assist in the dissemination of information to IOCEA Member States;
(vii) establish and maintain relations with relevant organizations, agencies, institutions and programmes with the view to promoting cooperation and collaboration with IOCEA;
(viii) assist in identifying partnerships and potential sources of funding to support the implementation of IOCEA programmes and other activities of interest to the Region; and
(ix) promote IOC and the National Committees of IOC and their activities in Member States and in the Region.

Resolution EC-XXXIII.14

IOC REGIONAL COMMITTEE FOR THE SOUTHERN OCEAN (IOCSOC)

The Executive Council,

Recognizing that the IOCSOC is different from other IOC regional bodies, whose role is to implement IOC programmes among geographically related Member States, and that partly because of this the IOCSOC has found it difficult to maintain momentum or to develop or implement programmes,

Recognizing further that the responsibility for coordination of operational oceanographic activities in the so-called Southern Ocean that was once seen as a part of the Terms of Reference of IOCSOC could be included in the Terms of Reference of GOOS and JCOMM in accordance with Resolutions XX-7, XX-8 and XX-12,

Noting that it could be important to continue the coordination of basic scientific research in the Southern Ocean at the intergovernmental level,

Instructs the IOC Executive Secretary to investigate the convening of an *ad hoc* working group comprising representatives of IOC, SCOR, SCAR, WMO, to consider suitable ways and means by which IOC would ensure partnership among interested organizations with a view to coordinate basic research in the Southern Ocean and to report to the 21st Session of the IOC Assembly, for its consideration. In executing such task, the working group shall in particular:

(i) analyse the needs for such coordination;

(ii) indicate how it relates to the interests of Member States in the Southern Ocean;

Recommends that the IOCSOC be dissolved by the 21st IOC Assembly.

Financial implications: US$4,000 from extra- budgetary sources

Resolution EC-XXXIII.15

TRAINING-THROUGH-RESEARCH CONCEPT AND THE FLOATING UNIVERSITY PROJECT

The Executive Council,

Being informed about the essential components of the Training-through-Research concept within the Floating University Project; its operations in the North Atlantic, Mediterranean, Black, and Baltic Seas; its cooperation, networking, planning, participation, data analysis and prolific scientific publication record, involving multinational universities, research institutions and industry,

Recalling Resolution XVIII-14, by which IOC decided to co-sponsor the Project through TEMA and to provide a limited financial contribution to its key activities of planning, student participation and publication,

Noting with satisfaction that:

(i) the innovative and internationally recognized success of the Training-through-Research concept, complementing shore-based and traditional shipboard training, has been fully realized within the Floating University Project, and represents the basis for its advanced research results,

(ii) the Project contributes to intercultural exchange and is developing to include partners from regions other than the initial regions of eastern and western Europe,

Recognizing that the execution of the Project would not be possible without substantial financial support from the Member States, which comes through bilateral cooperation agreements and from a number of national and European science projects, as well as from donors in offshore industry with direct interests in its research results,

Calling attention to the necessity for quick and adequate sharing and transfer of knowledge among the Member States, and for further developing and supporting the existing advanced teaching and training methods, and new forms of "training-through-research" in the field of marine sciences,

Expresses its appreciation to the Member States for the support provided to the Project;

Urges Member States to maintain and expand this support in the future;

Notes the intent of Resolution XX-19 to emulate and extend the concept by establishing a Caspian Sea Floating University;

Invites Member States to put forward proposals, accompanied by an outline of the available facilities and co-funding, leading to the establishment of "Floating Universities" in other regions.

Financial implications to the IOC: US$20,000 annually from Regular Programme

Resolution EC-XXXIII.16

UNITED NATIONS OPEN-ENDED INFORMAL CONSULTATIVE PROCESS ON OCEANS AND THE LAW OF THE SEA (UNICPOLOS)

The Executive Council,

Recalling the recommendation adopted by the 7th Session of the Commission on Sustainable Development addressed to the UN General Assembly to "*consider ways and means of enhancing the effectiveness of its annual debate on oceans and the Law of the Sea*",

Recalling the adoption by the UN General Assembly of Resolution 54/33 of 24 November 1999 establishing an Open-ended Informal Consultative Process on Oceans Affairs and the Law of the Sea (UNICPOLOS) in order to facilitate the annual review by the General Assembly, in an effective and constructive manner, of developments in ocean affairs by considering the Secretary-General's report on Oceans and the Law of the Sea and by suggesting particular issues to be considered by it, with an emphasis on identifying areas where coordination and cooperation at the intergovernmental and inter-agency levels should be enhanced,

Noting the Reports of the UN Secretary-General on Oceans and the Law of the Sea to the 54th and the 55th Session of the General Assembly that served as basis for the discussions in the First UNICPOLOS Meeting held in New York from 29 May to 2 June 2000,

Welcoming the recognition received by IOC as the focal point for Ocean Sciences and related services in the UN system, during the first UNICPOLOS meeting as well as the strong support received therein, for the proposal to discuss marine science and related matters at the second UNICPOLOS Meeting which should take place in 2001,

Noting that the IOC attaches importance in its activities to the rules of the Law of the Sea, in particular to the relevant provisions of UNCLOS,

Mindful of the importance of the oceans and seas for the earth's ecosystem, for the preservation and sustainable use of its vital resources, for food security and for sustaining economic prosperity and the well-being of present and future generations,

Convinced that Ocean Sciences and related services play a fundamental role for the knowledge, use and the sustainable development of the oceans, coastal zones and their resources,

Decides that IOC should lead the preparation of a comprehensive report of ongoing research activities in Ocean Sciences and related services in conjunction with the partner organizations of the UN system and other appropriate international NGO's with the view of making it available for the next UNICPOLOS Process;

Instructs the IOC Executive Secretary to transmit this decision to all the heads of relevant agencies and to the coming session of the ACC-SOCA in order to invite its members to define their contributions to the above mentioned report;

Further decides to establish an intersessional intergovernmental working group to ensure adequate input of IOC Member States to the proposed Agenda for UNICPOLOS in 2001, and **instructs** the Executive Secretary IOC to investigate with interested Member States ways and means of convening the intersessional intergovernmental working group at minimal cost to the Commission;

Further instructs the IOC Executive Secretary to initiate the development of a clearinghouse mechanism for ocean sciences with the purpose of facilitating Members States access to:

(i) relevant information derived from recent and ongoing research;
(ii) a list of ocean science global research programmes and projects;
(iii) opportunities on capacity building in Ocean Science;
(iv) a list of sources of information on Ocean Science;

Invites Member States to actively contribute and participate in the discussions on Oceans and the Law of the Sea during the 55th Session of the UN General Assembly and in the next UNICPOLOS Process in 2001;

Also invites Member States and partner organizations of the UN System to help in the development of the report and clearinghouse mechanism on Ocean Sciences, and related services.

Financial implications: US$60,000 from extra-budgetary sources

Resolution EC-XXXIII.17

CUTS IN THE REGULAR BUDGET

The Executive Council,

Recalling Resolution XX-25 of the Assembly and the new IOC Statutes,

Having examined Document IOC/EC-XXXIII/2 Annex 1 and its Addendum,

Reluctantly decides, under the circumstances, to distribute the reduction of US$362,000 among the IOC activities, as presented in the Annex to this resolution;

Invites the Chairperson, in consultation with the IOC Officers and the Executive Secretary, to prepare a proposal to the Assembly at its 21st Session:

(i) for a procedure to ensure that the Governing Bodies of IOC retain effective control over the incompressibility of the IOC regular budget;

(ii) to strive for a stable and appropriate budget for the adequate implementation of the Programme, and work of the Commission.

Financial implications: reduction of US$362,000 (Regular Programme)

Annex to Resolution EC-XXXIII.17

Distributions of Cuts in the Regular Budget

	USD
➢ IAEA/MOU/UNEP (Marine Ecological Laboratory of Monaco) (financial contribution suspended in 2000-2001)	100,000
➢ WCRP (final payment of biennium postponed)	50,000
➢ SAHFOS (Sir Alister Hardy Foundation Ocean Sciences - reduction of financial contribution/ $10.000 per year)	20,000
➢ Staff travel	14,000
➢ Some of the RAMP activities follow-up and IODE regional activities and representation of IOC at regional conventions on the protection of the marine environment	30,000
➢ OSNLR (2 coastal erosion workshops)	25,000
➢ IODE (reduced contribution to EURASLIC/IAMSLIC)	2,500
➢ GOOS (Cartagena Convention meeting cancelled)	2,500
➢ OSLR (2 HAB training courses cancelled)	25,000
❑ IOCEA HAB workshop	10,000
❑ HAB Study grants	8,000
➢ Policy (regular publications and public awareness campaign brochure, reduction of the length of meetings, reduction of one support staff for web site)	75,000
TOTAL	**362,000**

Resolution EC-XXXIII.18

INCOMPRESSIBILITY OF THE REGULAR BUDGET

The Executive Council,

Recalling Resolution XX-25 of the IOC Assembly,

Having examined Document IOC/EC-XXXIII/2 Annex 1 and its Addendum,

Considering the recently completed external evaluation of IOC commissioned by UNESCO, which recommended stability in the resourcing of IOC and an increase in the level of funding,

Noting with concern that the General Conference of UNESCO at its 30th Session did not endorse the request by the 20th Assembly to accept the IOC regular budget,

Further noting with deep concern that the Executive Board of UNESCO at its 159th Session reduced the IOC regular programme budget by US$362,000 (12.2%),

Considers that such reduction made without consulting the Governing Bodies of the Commission:

(i) adversely affects both the planning and the execution of IOC activities;

(ii) is not in conformity with the functional autonomy of IOC, as approved by the General Conference of UNESCO and expressed in Article 1 of the IOC Statutes; and

(iii) ignores the direction given by the General Conference of UNESCO to the Director-General and the Executive Board in paragraph K of Resolution 30 C/1, which recognizes the incompressibility of the IOC Budget and states that it shall not be subject to adjustments by transfer of funds to other parts of the UNESCO Budget;

Invites the IOC Chairperson to bring the above concerns to the attention of the Director-General, and to the next session of the Executive Board of UNESCO, with a request that solutions be found to remedy this situation in both the short-term and long-term considerations of the IOC regular budget.

Cost: none

ANNEX III

ADDRESSES & STATEMENTS

- A -
Opening Address by Professor Su Jilan
Chairperson of the Intergovernmental Oceanographic Commission of UNESCO

on 20 June 2000

Professor Patrick Obasi, Secretary-General WMO,
Dr. Patricio Bernal, IOC Executive Secretary and representative of the Director-General of UNESCO,
Officers of IOC,
Distinguished Members of the Executive Council of IOC,
Distinguished delegates,
Ladies and Gentlemen,

It is with great pleasure that I welcome you to the opening of this 33rd Executive Council of the Intergovernmental Oceanographic Commission of UNESCO. This year IOC also marks **its 40th anniversary**. This should be an opportunity to make a balance and look to the future.

Over the past 40 years IOC has evolved significantly from an organization devoted mostly to the coordination of scientific programmes, to an organization having expanded its role to serve the multiple needs of its Member States in developing their own capacity to use Science for the development and management of the uses of the Oceans.

The 30th session of the UNESCO General Conference approved the new Statutes of the Commission, retaining the original text approved by the 20th session of the IOC Assembly. This approval culminates a process of six years during which Member States of IOC endeavour to adapt the statutes to the new international context created by the United Nations Conference on Environment and Development (UNCED) in 1992 and the associated new Global Conventions, and by the entry into force of the United Nations Convention on the Law of the Sea (UNCLOS) in 1994.

In the new Statutes the mission of the IOC is defined as *'to promote international cooperation and to coordinate programmes in research, services and capacity building. In order to learn more about the nature and resources of the Ocean and Coastal areas and, I emphasize, to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and the decision making process of its Member States'*.

This evolution is not only a matter of emphasis. New emerging issues, such as environment, climate and global change, have forced societies to resort to science for solutions. This means that IOC has not only to deal with science issues *per se*, something that it has done successfully in the past, but to address the resources and management issues themselves, something that we have still to learn.

IOC has succeeded in these years to maintain a well-centered focus on Ocean Science in the UN system. This is a major asset. There is no question that there are difficulties in establishing the precise boundaries defined by the missions of the different UN Agencies. However nobody will dispute that IOC is the Ocean Science focal point for the UN system.

IOC, as a science organization, is very resourceful to find the information that we need for our work. Because of the unique nature of the ocean medium, scientific knowledge is the basis for any meaningful use of the Oceans. In the past, this view has largely lain only with us in IOC. However other organizations and people are increasingly sharing this view today.

This recognition was once more ratified in the last UNICPOLOS meeting. The United Nations Informal Consultative Process on Ocean and the Law of the Sea, I had the opportunity to attend together with our Executive Secretary, was held in New York from the 29 of May until the 2 of June. IOC got unanimous recognition as the leading agency of the system in Ocean Science, and also in Global Ocean Observations through its leadership in GOOS.

This is a very important achievement that we, here in IOC, must be ready to build upon. For example, it was the consensus of the participants in New York that next year UNICPOLOS would deal with Ocean Science. We have expressed our interest and willingness to take on the leading role in the preparation for this forthcoming meeting, together with other UN agencies, NGO's and other interested parties.

There were many interventions in New York on the need of information on Ocean Sciences for a host of users. Facing this challenge we also offered to lead the development of a "clearing-house mechanism" for Ocean Science. This idea was very well received by the meeting. Maybe during this Executive Council we could discuss this possibility, and what it would take to develop such a system. To do it right we should develop it in association with our partners within and outside the UN-system. But this would be an enormous opportunity to strengthen our links with them.

In this Session, we will also have the opportunity to review the results of the External Evaluation of IOC. I have read the report and find it very useful. The report, passing an independent judgment on the importance of the IOC and the IOC programme, highlights the Organization as an opportunity for UNESCO. It also points out the existing weakness, both internally and externally, that we need to overcome to take up the opportunity. We must examine these suggestions. Despite significant efforts to improve coordination with the other Science programmes of UNESCO, IOC still has a low recognition among the permanent delegations that attend the UNESCO General Conference. So we need to call the attention of the Conference to this important report. After all it was the UNESCO General Conference that requested the evaluation in the first place.

Perhaps a reflection of this difficulty lies in the fact that the General Conference asked for a reduction of the budget of UNESCO. The new Director-General of UNESCO, Mr. Koïchiro Matsuura, was charged with the duty to find 10 millions in "savings". In this occasion, IOC was affected with the cuts approved by the recent session of the Executive Board of UNESCO. We are concerned by this decision, and we would like to see that the incompressible nature of the IOC budget is not affected in the future and that this cut should not constitute a precedent.

Mr. Matsuura has started a vigorous plan of reform in UNESCO. We welcome this process. We also want to contribute to the success of this task. There are many things that can be improved in UNESCO. Maybe it is appropriate to request from UNESCO to receive our budget **as a financial allocation, and not as a part of the general budget of the Science programmes of the Organization**. This would elevate the level of our financial autonomy. At the same time it would require from us a very efficient **management system.** Maybe the reform process in UNESCO is the right time for us to solve any pending issues with respect to our functional autonomy. I am sure that Mr. Matsuura will be open to consider any reasonable proposal from our part.

Now that we have expanded our responsibilities we need to further engage our governments in support of our work. We have been extremely successful in leading the development of Operational Oceanography, something that is well reflected in the progress of GOOS. We have been very successful in developing partnerships with our sister organizations in the UN, most notably with WMO, in the development of the Climate Agenda. We have a unique relationship with SCOR of ICSU that facilitates the linkage with the scientific community. However to succeed in the many challenges we face today, we need to further develop our cooperation with other organizations, as well as the increased support from our Member States. These are the important issues that, I believe, we should start to address in this council meeting. I look forward to a lively and fruitful debate in the next ten days.

- B -
Opening Address by Dr. P. Bernal, IOC Executive Secretary and Assistant Director-General of UNESCO

on 20 June 2000

NEW PARADIGM FOR THE ENVIRONMENTAL AND GEO-SCIENCES: MONITORING FOR SCIENCE AND MANAGEMENT

The changing scenario: Mainstreaming of Environmental issues

After three decades of the first World Conference on Environment in Stockholm (1972), environmental issues have become central to policy makers at the national, regional and global level. The Environment has become mainstream. The new Global Conventions on Biological diversity, Climate Change, Desertification, call for a new level of commitment by the nations of the world. For the Ocean, the coming into force of the UN Convention on the Law of the Sea, (UNCLOS, 1994) finally placed the oceans on the political agenda of all coastal nations.

This mainstreaming of environmental issues is associated to the emergence of new institutions both at the national level (ministries of environments) and at the international level (UNEP and some major NGO's such as ICSU and IUCN). This new political framework has had a strong impact on the development of global science.

It is fair to say that thirty years ago, most of the research done, was essentially driven by science, and in that sense was *supply driven*. Today the situation is the inverse: most environmental science programmes are *demand driven* by societal needs. Society is increasingly demanding the scientific knowledge needed to solve certain priority issues.

The mandates of Society and their integration

This requires better focusing of the activities of the international organizations, among them IOC. It is not sufficient to have the capacity, it is necessary and essential to have a legitimizing mandate from society expressed through an established intergovernmental review process.

In the context of the working of the UN Commission for Sustainable Development (CSD), UNESCO and its IOC have that mandate as the UN agency acting as Task Manager for Science and Education for *Agenda 21*. Furthermore in the context of the Inter-Agency Committee on Sustainable Development (IACSD), the ACC Sub-Committee for Ocean and Coastal Areas, charged collectively as task-manager of Chapter 17 of *Agenda 21*, IOC is the sub-task manager of sub-programmes. These Conventions have increased substantially the level of commitment of national governments in different areas, for which many of them have limited capacity in place to answer in the short term.

After a significant effort on the part of the conventions and other programmes, focused on specific environmental problems, there is a growing realization, that this piecemeal approach will not be sufficient. We recognize better now the linkages among the different environmental issues. Solutions adopted in one convention to some problem might have a negative impact on another issue being dealt with under another convention. Solving a biodiversity problem in the rainfall forest might increase a problem in the area of climate change. In solving one environmental issue, we have to be aware of the impact that the solution might have on other issues. This new integrated approach is forcing a parallel integration of the planning of the Conventions secretariats and will certainly have an impact on funding mechanisms. An equivalent effective mechanism to coordinate the work of the intergovernmental programmes in UNESCO is needed to respond to this new challenge.

Monitoring for compliance with the international agreements

Conventions are agreeing on abatement strategies or management commitments. Assessments of these actions require the development of a reliable and objective database for measuring progress. The reliability and transparence of an international system would provide an additional incentive for compliance by the parties to the different global Conventions.

For example, the design of the Coastal GOOS still in progress, opens a major opportunity to define in a very cost-effective way, the requirements for collecting the fundamental data necessary for policy implementation and for monitoring compliance. The relative success of abatement strategies, needs to be assessed by measuring the changing state of the environment.

Monitoring for knowledge

There is a paradox in studying climate and long-term ocean fluctuations. As John Woods expressed last year in the Bruun Memorial Lecture, we will not be able to mount a scientific attack to Ocean predictability until we have sufficient data.

On a more fundamental note, because the natural systems affected by humanity, in particular the Climate System are very complex, they contain some irreducible, intrinsic level of uncertainty that societies need to learn how to manage. Furthermore, some of the policy options that will have to confront will not diminish uncertainty, but rather will exacerbate it.

The bottom line is that even after a successful completion of the current scientific agenda, that is, after all the research efforts we are now undertaking and the ones we are planning for the coming decades are successfully completed, there still will be some residual uncertainty to deal with. This means that no amount of acquired knowledge will replace the need to observe, to monitor the state of the several natural systems involved, and of the combined effect of use and user pressures on them.

Today we monitor some of the systems we require. Before the end of this century, as pressure increases, we will need to monitor all of them. We shall see a planet fully instrumented for acquiring the accurate data needed to derive the environmental information to make timely decisions. We will fully monitor the atmosphere, the water cycle and the water reservoirs, the upper and deep Ocean, the land cover and the changes in land use. These will be also necessary to provide early warning of unforeseen sudden changes of the state of this highly non-linear system.

Because monitoring has this double function: to provide information for knowledge (that is *science*) and information for policy (that is *management*), IOC, together with the other sister organizations of the United Nations and with the other UNESCO's intergovernmental programmes are called to play a fundamental role in making this new paradigm a reality.

- C -
Address by Professor G.O.P. Obasi
Secretary-General, World Meteorological Organization

on 20 June 2000

Dr Su Jilan, Chairperson of the IOC,
Dr Patricio Bernal, Executive Secretary of the IOC,
Distinguished members of the Executive Council,
Ladies and Gentlemen,

It is indeed a pleasure and an honour for me to be here today to address the 33rd session of the Executive Council of the Intergovernmental Oceanographic Commission (IOC). As the Secretary-General of the World Meteorological Organization (WMO) this is the first time that I am privileged to address the Council. I therefore wish to seize this opportunity, on behalf of the World Meteorological Organization and my own, to express my appreciation to Dr Patricio Bernal, Executive Secretary of the IOC for his kind invitation and cooperation since his appointment, and to pay tribute to Dr Gunnar Kullenberg, the former Executive Secretary, for the excellent and mutually beneficial relationship that was fostered between IOC and WMO during his tenure of office.

Mr Chairman, Members of the Council,

As you are aware, the partnership between WMO and IOC can be traced to the mid-fifties when UNESCO and WMO collaborated in the field of oceanography at the request of the United Nations. The partnership took a new dimension with the establishment of IOC in 1960. Indeed, over the past ten to fifteen years, the recognition of the inextricable linkage between the atmosphere and the ocean as components of the global climate system has led to

a whole new range of joint programmes, projects and coordination mechanisms. This is promoted through the periodic joint meetings between IOC Officers and WMO Bureau members and the close collaboration between IOC and WMO within the context of the UN system and at regional levels. At the same time, enhanced mutual understanding, not just between our Organizations, but between meteorologists and oceanographers, in general, has greatly facilitated the successful development and implementation of a number of joint activities.

This is particularly true in relation to research on global climate and climate change. The success of the major climate research projects within the WMO/ICSU/IOC-sponsored World Climate Research Programme (WCRP), such as the Tropical Ocean and Global Atmosphere (TOGA) project, the World Ocean Circulation Experiment (WOCE) and the Climate Variability and Predictability (CLIVAR) study, has been critically dependent on meteorologists and oceanographers working together as partners. Over the past decade, the WMO/ICSU/CINEP/IOC-sponsored Global Climate Observing System (GCOS), with its atmosphere, ocean and land components, has also clearly demonstrated the need for a fully interdisciplinary approach to observing, monitoring and predicting the global climate system. In this context, I would like to express to you the gratitude of WMO for the substantial support which IOC has provided already for both GCOS and WCRP, and I am confident that you will be able to continue this support in the future.

By the same token, WMO appreciates and is very supportive of your work to design and implement the Global Ocean Observing System (GOOS). This is clearly an enormous and complex task, and the IOC is to be congratulated on the substantial progress which has been made in recent years in GOOS design. While WMO's primary interest is in physical oceanography, and in the climate and services aspects of GOOS, we look forward to continue working with you in the implementation of these activities through our Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). At the same time, it is interesting to take into account the likely interactions between the atmosphere and ocean chemistry and biology. An obvious example is the substantive atmospheric transport of pollutants into the ocean, which is an important study area for the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), while coastal areas, where the ocean, atmosphere, land and human beings interact, clearly demand a fully integrated approach. Thus it may be that, at some time in the future, JCOMM could also be called upon to assist in the implementation of non-physical aspects of GOOS. If such is decided by the IOC Governing Bodies then WMO will, of course, do everything it can to assist.

Mr Chairman, Ladies and Gentlemen,

If you permit, let me say a few more words about the JCOMM. As you are aware, following the parallel decisions of the WMO Congress and IOC Assembly last year to establish the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology, we are now entering into a new era of greatly enhanced cooperation and joint programme activities. WMO views the new Commission with enthusiasm and hope for the future of operational marine observing systems and services. At the same time, it represents a unique example of cooperation, not just between meteorologists and oceanographers at the national level and our two Organizations but also throughout the United Nations system.

JCOMM represents a truly significant step forward in our cooperation and collaboration. For us in WMO, it is the first time that a WMO constituent body has been co-sponsored by another Organization. Despite the small but potentially tricky constitutional and

regulatory questions that such a co- sponsorship has posed for us, WMO Members nevertheless accepted JCOMM with great enthusiasm, thereby demonstrating a strong belief in the necessity and value of working in close partnership with you in dealing with important programmes of mutual concern. As mandated by our governing bodies, our two Secretariats are now addressing the various organizational issues in running JCOMM, and I have no doubt that our obvious common desire to see JCOMM succeed will lead to rapid and satisfactory solutions.

More importantly, however, is to ensure that JCOMM develops quickly as an efficient and effective mechanism for coordinating and integrating marine observing systems, data management and services. JCOMM must at the same time retain and strengthen the ongoing priority programmes of the former WMO Commission for Marine Meteorology (CMM) and Integrated Global Ocean Services System (IGOSS) and also take on urgent new issues such as an operational ocean observing system for climate. The second transition planning meeting for JCOMM, which you so kindly hosted here in Paris last week, took some important steps in the development of proposals concerning a future JCOMM structure and work plan, and in preparing for the first session of the new Commission, planned to be held in June 2001 at the kind invitation of the Government of Iceland.

Mr Chairman, Ladies and Gentlemen,

I believe that we can look forward to the future of JCOMM with considerable optimism. It is an exciting new approach to operational oceanography and marine meteorology, which we in WMO see as somewhat analogous to our Commission for Basic Systems (CBS), which is the body that coordinates and regulates the operations of the World Weather Watch. However, JCOMM's work is also in many ways more complex and wide-ranging than that of CBS, which presents us with an interesting and exciting challenge. JCOMM also represents a new paradigm in interdisciplinary and inter-agency cooperation, in which two international organizations have agreed to pool their expertise and resources in pursuit of common objectives. The JCOMM concept has already drawn favourable comment within the UN system, and I believe may eventually be the model for sir-nilar cooperative developments in other disciplines such as hydrology.

Mr Chairman, Ladies and Gentlemen,

I would like to touch briefly on one other issue of considerable importance. I am aware that this session of your Council will be having substantive discussions relating to the development and elaboration of an IOC policy and practice for the international exchange of oceanographic data and products. As you know, this is an issue which is also of major importance to WMO. Most members of your Executive Council may be already aware of Resolution 40 (Cg-XII), unanimously adopted by the twelfth World Meteorological Congress in 1995, which deals with WMO's policy and practice for the international exchange of meteorological and related data and products. A parallel resolution (Resolution 25 (Cg-XIII)), covering hydrological data and products, was adopted last year by the thirteenth World Meteorological Congress.

These resolutions were arrived at only after long and difficult negotiations. Nevertheless, we believe that the resolutions have been very successful, They have allowed WMO to retain the fundamental principle of free and unrestricted exchange of meteorological data and products, and in practice to expand the quantity of data and products exchanged, in the face of the rapidly increasing commercialization of meteorology and of widely differing

government policies in this regard. Interestingly, Resolution 40 (Cg-XII) lists, in an annex, a wide range of oceanographic variables as data to be freely exchanged, without restrictions on use, which is a clear recognition of the global importance of such data to applications such as maritime safety and global climate studies.

It is clearly the responsibility of the IOC Governing Bodies alone to develop and adopt their own policy and practice with regard to the exchange of oceanographic data and products. However, the fifty-second session of the WMO Executive Council held last month noted this work on your part with considerable interest, and offered to provide to you our own experience and assistance on the issue, as you may require. In addition, we believe that it is very important that the policies and practices for the exchange of environmental data and products adopted and applied by our two Organizations should be at least mutually compatible and reinforcing. I therefore wish you every success in your deliberations on the topic.

Mr Chairman, Ladies and Gentlemen,

When I referred earlier to our partnership, I meant a true partnership that serves the interests of National Meteorological Services, and of WMO as an Organization as well as those of national oceanographic agencies and institutions, and the IOC. The joint efforts should contribute to providing, in an efficient and effective manner, environmental data, scientific advice and services in support of sustainable development and environmental management. Of course, while we have many programmes and projects which are unique to our two Organizations and disciplines, there remain nevertheless many matters of truly mutual concern, particularly in the areas of global climate studies and ocean services. It is not just valuable, but essential, that we address these with a common purpose and voice, if we are to achieve the global recognition for our work and the support from governments required to fulfil our mandates.

As a vigorous and growing Organization, IOC will continue to receive our support in its effort to build understanding and involvement within the global oceanographic community of concepts such as operational systems and services, and real time data collection and management. I can assure you that WMO is fully committed to collaborating with IOC in the challenging task ahead. As a small token of this commitment, I can confirm that WMO will continue, for the foreseeable future, its long-standing support to the IOC Secretariat, in terms of both professional and secretarial staff. We hope that this support will ultimately help to strengthen the capability and flexibility of your efficient and effective Secretariat in dealing with all of its many programmes, not only those of direct interest to WMO.

Mr Chairman, Ladies and Gentlemen,

I thank you once more for the very kind invitation to address the IOC Executive Council, which I take as a recognition on your part of the importance of the relations and cooperation between our two Organizations. I can assure you that this recognition is mutual, and that WMO for its part will do everything it can to reinforce and expand its cooperation and work with IOC as a reliable partner in environmental monitoring and services, in support of improving our understanding of the global climate system, and sustainable development.

Thank you.

- D -
Welcoming Address by Prof. Su Jilan
IOC Chair, for the Director-General venue

on 22 June 2000

Mr Director-General of UNESCO
Ms Chairperson of the Executive Board of UNESCO
Distinguished delegates,
Ladies and Gentlemen,

I feel very honoured to welcome Mr Koïchiro Matsuura to our 33rd session of the IOC Executive Council. This is a special occasion since it is the first time that Dr. Matsuura is with us. It is also special because this year marks the 40th anniversary of IOC.

IOC has a special status in UNESCO. We are a body with functional autonomy. At our Assembly and Executive Council meetings, Member States make their views known and take decisions. That has enable IOC to respond readily to the needs of the Member States and, in this process, to gain high visibility within and outside the House.

Since its establishment 40 years ago, IOC has provided a consistent focal point for Ocean Sciences in the UN system. We have long been known of the importance of Ocean Sciences in practical applications. In the new IOC Statutes, approved by the last General Conference of UNESCO, IOC has expanded its traditional mandate on Ocean Sciences *per se* to incorporate the applications that enable our Member States to use Science in the building of sustainable policies for the development of ocean resources and the coastal zones. This is our new challenge.

We are very pleased to report to you that this role of Ocean Sciences in the sustainable uses of the oceans has been fully recognized in UNICPOLOS, the very high level consultation on Oceans and the law of the sea, that took place in New York from the 29 of May to the 2 of June, in preparation of the coming discussion in the UN General Assembly. The Consultation unanimously endorsed the idea to deal with Ocean Sciences in next year UNICPOLOS meeting. This gives UNESCO, through its Intergovernmental Oceanographic Commission, an opportunity to collaborate with other UN Agencies to prepare for next year's high level consultation. We have offered there our leadership and it was greatly appreciated and acknowledged.

Mr. Director-General, here in IOC, we have been very concerned by the implementation of the budgetary cuts mandated by the 30th General Conference. We expect that these cuts should not create a precedent and that they should be considered as an extreme solution to very pressing needs. We understand and we are quite aware of the very difficult task you have accepted. Your efforts to re-build a trustful relationship with the governing bodies is well acknowledged.

I would like to offer you all the support of IOC in the huge task of reforming UNESCO. We are part of UNESCO and are willing to make our contribution. We all have high hopes in your capacity to steer the organization to a level of recognition and success that it rightly deserves. I wish you well in your endeavour.

It is now my privilege to give the floor to Mr Director-General.

- E -

Address by Mr Koïchiro Matsuura
Director-General of the United Nations Educational,
Scientific and Cultural Organization
(UNESCO)

UNESCO, 22 June, 16.00 hrs, Room X

Mr. Chairperson,
Distinguished Members of the Executive Council of the IOC
Distinguished delegates
Ladies and Gentlemen,

I am pleased and honoured to have this opportunity to address the 33rd Executive Council of the Intergovernmental Oceanographic Commission of UNESCO.

I am delighted that my first meeting with the Commission coincides with the celebration of the IOC's 40th anniversary. I congratulate the IOC on its four decades of highly productive activity.

Anniversaries are occasions for assessing progress achieved and also an opportunity to look ahead and attempt to chart the future.

Over these 40 years, the IOC has provided a continuous focus on the Ocean, not only for UNESCO, but also for the UN system. It has done so, not only for ocean sciences, but also for a series of emerging ocean issues that have shaped the way we see the Ocean today. The IOC was active in the discussions that led to the adoption of the United Nations Convention on the Law of the Sea. It long provided leadership in the protection of the marine environment and in the monitoring of marine pollution.
Naturally, its focus has been mostly on the coordination of research – this is particularly important, as oceanography is a multidisciplinary endeavour that requires international cooperation.

Over the years, IOC activities have expanded from the coordination of basic scientific programmes to address broader coastal development and management issues. The full scope of its role is reflected in its revised statutes, approved last November at the Thirtieth Session of the General Conference of UNESCO. These define the IOC's mission as being *'to promote international cooperation and to coordinate 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'*. This multifaceted mission is indeed a challenging one.

An external evaluation has looked at ways in which the IOC can best carry out its demanding mission. I believe that you will be considering the final report of the External Evaluation, which I have also received and read with great interest. The report is very complete and makes some valuable suggestions. The panel thinks UNESCO has a clear opportunity to strengthen the role of the IOC as a focal point for ocean science.

I am definitely in favour of the IOC playing a leading role in this respect and I value the role that the IOC plays in coordinating work on oceans and coastal areas in the UN

system. Of course, this recommendation should not imply, in any way, that we should contemplate the creation of a new agency within the UN system. On the contrary, the IOC's position within UNESCO is a "plus", both for the IOC and for UNESCO, as it offers the added value of a framework which embraces all the environmental sciences. The IOC already draws great strength from this inter-disciplinary context and can go on to maximize the value of these inter-connections in the years to come.

Indeed, I believe that this potential for developing an interdisciplinary approach, essential for tackling the problems of today's world, will improve as a result of the reform process which is now underway at UNESCO. You are of course aware that, as the new Director-General of UNESCO, I set in motion this reform process immediately upon taking up my duties at the end of last year.

I will not repeat the details of the reform process here, as all my statements on this matter are available on UNESCO's Internet site. But what I do want to emphasize here today, is that the reform process offers an opportunity to examine the relationship between the IOC, the other Science Programmes and the rest of UNESCO. All of my efforts to rationalize and reform UNESCO share a common goal: to enable the Organization to move towards greater relevance and effectiveness - and this requires far greater interdisciplinarity than in the past.

The IOC made undeniable contributions in the past to science education and is, I know, ready to contribute again. Many of the issues facing humanity in the 21st century relate to the need to harmonize the economic growth required eradicating poverty, with the maintenance of the basic life support system of the planet. This difficult equilibrium is at the core of sustainable development. It requires the public to be scientifically and environmentally literate and ready to act responsibly to protect the global environment. The IOC has much to contribute to science education and awareness-raising in this respect.

On another aspect of the reform process, I would like to stress that my plans for reform of management of the Secretariat should also benefit the IOC.
Improvements to decision-making, performance and accountability within the Secretariat will, I sincerely hope, have positive benefits for the full and efficient implementation of the mission defined in the new statutes of the IOC.

Ladies and Gentlemen,

I understand that you have expressed some legitimate concern over the reduction in the budget of the IOC for the current biennium. I want to be extremely clear on this question. This was a statutory cut required by the General Conference. It asked me at its 30th Session, to find savings of at least 10 million dollars, in order to strengthen the Organization's activities in a number of designated areas.
These savings were spread across the Organization, including the IOC and the World Heritage Centre. It is my sincere hope that these budgetary savings will have only a limited impact on the activities of the IOC.

This is all the more important as the new medium-term strategy offers an opportunity to chart its future.

Your programme is ambitious. You are leading the effort to develop the Global Ocean Observing System and, together with the WMO, are proceeding with the implementation of J-COMM, the Joint Commission of Oceanography and Marine Meteorology. These

undertakings attempt to meet the pressing need for better scientific understanding of processes of critical importance to humanity and for the future of our planet.

In the years ahead, ocean issues seem set to remain high on the international agenda. The IOC Executive Council has to debate matters of critical importance for sustainable development. The IOC is concerned with areas of science, which raise high expectations because they respond to urgent needs.

In conclusion I would like to say on this, our first encounter, that I place great confidence in your efforts. I attach the highest importance to the work of the IOC. You are examining matters of the great importance in the course of this meeting. I look forward to hearing the outcome of your deliberations and I wish you a most successful session.

- F -
Turkey's Statement

under Agenda Item 6.2: UNCLOS (IOC and the UN Convention on the Law of Sea) Regarding the Advisory Body of Experts on the Law of Sea (ABE-LOS)

In accordance with resolution 19 of the 19th IOC Assembly the member states were invited to nominate two experts to the Advisory Body of Experts on the Law of Sea (ABE-LOS).

The Turkish authorities are considering to appoint two experts to the Body and will inform their names to the Secretariat shortly.

I would like to mention on the other hand that Turkey is not a party to the UN Convention on the Law of Sea. However she is closely interested with the marine scientific research because of its long sea cost.

ANNEX IV.

THE ROGER REVELLE MEMORIAL LECTURE, 2000
21 June 2000

Responding to Climate Change: Scientific Questions Regarding the Possible Disposal of CO_2 in the Deep Ocean

By

Peter G. Brewer
Monterey Bay Aquarium Research Institute
Moss Landing
CA 95039
U.S.A.

Dr. Brewer is an ocean chemist, and Senior Scientist, at the Monterey Bay Aquarium Research Institute (MBARI). Prior to joining MBARI in 1991 he spent 24 years as a researcher at the Woods Hole Oceanographic Institution, rising to the rank of Senior Scientist. He served as Program Manager for Ocean Chemistry at the National Science Foundation 1981-1983, receiving the NSF Sustained Superior Performance Award. He has taken part in more than 30 deep-sea cruises, and has served as Chief Scientist on major expeditions world-wide. He is a Fellow of the American Geophysical Union, and of the American Association for the Advancement of Science. Internationally he has served as a member of SCOR, and as Vice-Chair of JGOFS. He has served as a member of the Vice-President's Environmental Task Force, and is a member of MEDEA. He served as President of the Ocean Sciences Section of AGU from 1994-1996. Dr. Brewer holds a "By Courtesy" appointment in the Stanford University Dept. of Geological and Environmental Science.

At MBARI he served as President and Chief Executive Officer from 1991-1996, completing major laboratory and SWATH ship construction programs and doubling the size of the Institution, before returning to full time research. His research interests are broad, and include the ocean geochemistry of the greenhouse gases. He has devised novel techniques both for measurement, and for extracting the oceanic signatures of global change. At MBARI his current interests include the geochemistry of gas hydrates, the evolution of the oceanic fossil fuel CO_2 signal, and strategies for the sequestration of fossil fuel CO_2 in the deep ocean. He is author, or co-author, of more than 90 scientific papers, and the editor of several books.

Dr. Brewer and his wife Hilary were both born in England, and are naturalized US citizens. They make their home in Carmel, California.

"I do not pre-judge whether this course of action will ultimately be seen as wise. But I do believe that it is important that those decisions be based upon sound scientific evidence, evidence that only the international ocean scientific community can provide."

photo by Mary White

Introduction.

I am speaking to you today to recommend a policy of engagement. Engagement that is in evaluating at a high level the scientific underpinnings of direct ocean CO_2 disposal as one of the possible means of holding future atmospheric CO_2 levels "at a level that would prevent dangerous anthropogenic interference with the climate system." This topic is now widely debated in the energy industry, and increasingly in the popular press. There have been very successful meetings organized by the International Energy Agency (IEA). But I believe that it is fair to say that the ocean science community, that is the worldwide professional body of scientists represented by this Commission, has so far been largely disengaged from this process. Yet the work that has been done so far, by small groups in Norway, Japan, and the Unites States, has yielded fascinating results that have the capacity to tell us much about the science of the ocean. Would such a course of action be wise? We simply do not know, and there are enormous unanswered questions.

Direct injection of CO_2 is not the only ocean science strategy we can contemplate for addressing the climate problem. Ocean fertilization by trace quantities of iron over vast regions so as to stimulate phytoplankton growth and thereby draw down oceanic pCO_2 has also been proposed. A number of iron enrichment experiments have already been successfully carried out in the field, but questions over the rapid recycling of the carbon fixed have been raised.

We thus must weigh two strategies, one involving direct injection of concentrated CO_2 at specific locations in the deep ocean. And one involving the manipulation of ecosystems over vast areas for a long time, much as we do on land. In taking on this challenge we would be building directly on the legacy of Roger Revelle, and on his vision both in 1960 of what the IOC could be, and in 1979 when he addressed the Eleventh IOC Assembly on the role of the ocean in climate change. Predictions of a rapidly changing world, many of them initiated by Roger, are coming true; the science of what our response will be has barely begun.

The general problem of climate and the ocean needs no introduction here. The 1979 SCOR-IOC creation of the Committee on Climate Change and the Ocean, with Revelle as first Chairman, is testimony to that. Nor is there need to review the complexity of determining what "dangerous anthropogenic interference with the climate system" actually is, for very large and sophisticated observation and modeling programs of these intrinsically turbulent systems are well underway with SCOR-IOC sponsorship. But if we detect change, and determine a danger level, what scientific advice will we then be called upon to give?

Background.

We are already disposing of fossil fuel CO_2 in the ocean, and in enormous quantities. Revelle and Suess made the first formal estimates of ocean CO_2 uptake in 1957, and the very first SCOR working group addressed the technical details of the dissociation constants of CO_2 in sea water. Thus the IOC and SCOR have a long and honorable history of scientific involvement here. The 1995 IPCC Scientific Assessment was that ocean fossil fuel CO_2 uptake from the atmosphere by gas exchange was about 2.0 ± 0.8 GtC/yr, or 7.34 ± 2.9 Gt CO_2/yr (for we cannot dispose of carbon alone) for the period 1980-1989. It is now some 15 years later, and atmospheric CO_2 levels have risen by about 22 ppmv, or a further 30% above the pre-industrial level. We may thus estimate that we possibly "dispose" of about 9.5 Gt CO_2/yr in the surface ocean today. That is in the thin layer where all photosynthesis occurs, where coral reefs grow, and the most marine life is found. Is this wise? And how does this quantity compare with projections for the future?

Most experts agree that this upper ocean uptake/disposal has important benefits for mankind. It has greatly moderated the atmospheric CO_2 growth rates, and has permitted the continued use of fossil fuels that have done so much to benefit society. Yet if we look to the future concerns must surely arise. By simply extrapolating the "Business as Usual" IPCC scenario we would see a much changed ocean by the end of this century. In Table 1 I present a simple specimen calculation of the chemical trajectory we may be embarked upon.

Table 1: The evolving chemidtry of surface sea water under "Business as Usual"

Time	pCO_2	Total CO_2	pH	HCO_3^-	$CO_3^=$	H_2CO_3
yr.	µatm	µmol kg^{-1}		µmol kg^-	µmol kg^{-1}	µmol kg^{-1}
1800	280	2017	8.191	1789	217	10.5
1996	360	2067	8.101	1869	184	13.5
2020	440	2105	8.028	1928	161	16.5
2040	510	2131	7.972	1968	144	19.1
2060	600	2158	7.911	2008	128	22.5
2080	700	2182	7.851	2043	113	26.2
2100	850	2212	7.775	2083	97	31.8

This simply takes a sample of surface sea water at a constant 15°C and 2320 µmol/kg alkalinity from equilibrium with an atmosphere of 280 ppmv CO_2 in about 1800, to the year 2100. The pH of the surface ocean has dropped by 0.416 pH units, and the carbonate ion has dropped by about 55%.

It is unlikely that we will reach this point, since the UNFCCC has adopted stabilization of greenhouse gas concentrations as a goal. But what will it take to achieve that?

The size of the problem.

There are many scenarios for future growth of greenhouse gas levels, but a target for the community of nations of stabilizing CO_2 concentrations at about 550 ppmv, or double the pre-industrial level, is usually taken as an example. The so-called "Kyoto Protocol" adopted by COP 3 of the UNFCC in 1997 takes a first courageous step towards this goal, but it falls well short of achieving it. In brief we may achieve this stabilization by conservation and enhanced efficiency. We may substitute alternate energy sources such as nuclear or solar power. We may shift to more hydrogen rich fossil energy sources such as methane. And we may consider carbon sequestration through the enhancement of sinks or through deliberate disposal strategies.

No element alone is likely to succeed, and in practice all of the above strategies are likely to be used. But taken together they should approach a solution to the problem. The most widely accepted calculation for stabilization at 550 ppmv, based upon the IPCC projections, suggests that a departure from "Business as Usual" of about 3.67 Gt CO_2/yr by 2025, and 14.67 GtCO_2/yr by 2050 will be required by the combined efforts of all nations. These are truly enormous numbers, which approximate the CO_2 output for the entire world in about 1932 and 1967. How will this goal be met?

The present definition of "sinks".

The UNFCCC "Kyoto Protocol" gave special definition of sinks as limited to "direct human-induced land-use change and forestry activities, limited to aforestation, reforestation, and deforestation since 1990." In this narrow definition direct oceanic or geologic CO_2 disposal may not yet be recognized as a sink, and carbon credits not applied. Broadly viewed, the protocol in its present form would seem to impose an external regulation of the rate at which a nation could fuel its economy. Political opposition to this is likely to arise, but energy usage followed by safe disposal of the waste products would be one way to overcome these objections. The activities of the Framework Convention are still very much in progress and we may expect modifications ahead that will likely recognize a broader set of options, and credit for emissions foregone.

For the present the focus is on terrestrial ecosystem management, and it would be of great benefit to the world if simple but large-scale changes in land use could bring about the desired changes in atmospheric CO_2 levels. Unfortunately it does not seem as

though this alone will have the long-term capacity, and there are many important pressures on land use beyond carbon sequestration.

Trading of carbon credits is presently favored by economists as the most efficient strategy. Yet that assumes that nations will have excess carbon credits to trade. In the short term this may be possible, but in the longer term steps to actively reduce national emissions will be needed.

The chemical capacity of the ocean.

In the long term some 85% of the fossil fuel CO_2 disposed of in the atmosphere will be transferred to the ocean. The rate of water mass conversion is sufficiently slow that we are building up CO_2 in the atmosphere faster than it can be removed by ocean circulation. Today there are sophisticated ocean circulation models incorporating the carbon cycle, but even a simple calculation can reassure us of the ultimate oceanic chemical capacity. The volume of sea water is about $1.37*10^{21}$ litres. One Gt C is $8.3*10^{12}$ moles. Disposal of 1 GtC fully mixed into the entire ocean would change the total CO_2 concentration by only 6.1 nanomoles per liter. If we take the detection limit for measurement of CO_2 in sea water by the most careful procedures today as 1 μmol/litre, then we would in theory have to dispose of about 164 GtC before the signal could even be detected. Ultimately the chemical capacity is very large indeed.

In practice we would not have such an impossibly dilute and well-mixed signal. We would have concentrated sources, the evolution of a tracer field, and concerns over deep-sea biology and carbonate sediment geochemistry. Eventually ocean circulation will return the disposed CO_2 to atmospheric exposure, but here the Revelle factor will ensure quite efficient oceanic retention.

The chemistry of CO_2 in sea water.

The basic principles of ocean CO_2 chemistry are familiar to almost all ocean scientists, but it may be useful to give a brief survey here. The initial effect of adding CO_2 to sea water, either through the natural respiration of deep sea organisms, or through active disposal, is to consume carbonate ion as in the reaction $CO_2 + CO_3^{=} + H_2O \rightarrow 2HCO_3^{-}$ thus lowering the pH. This eventually drives a response from the carbonate sediments on the sea floor

$CO_2 + CaCO_3 + H_2O \rightarrow Ca^{++} + 2HCO_3^{-}$

These two reactions account for the chemical capacity of the ocean for atmospheric CO_2 removal.

However for injection of pure CO_2 gas or liquid we must face another phenomenon, that of clathrate hydrate formation. Gas hydrates are an ice-like solid formed by van der Waals electrostatic forces between gases (CO_2, CH_4, etc.) and water at low temperature and high pressure. Each gas molecule is trapped in a cage of water molecules, so that the bulk formula is about $CO_2.6H_2O$. In practice for molecules of this size a more complex unit cell structure of small pentagonal faced cavities, linked by larger hexagonal faced cavities, is formed. Enormous quantities of methane gas hydrates occur naturally in the deep ocean (another topic which Roger Revelle contributed too), and CO_2 hydrates have an identical crystal structure.

CO_2 hydrates are readily synthesized in the laboratory, and have now been made in the deep ocean in a series of experiments by my own research group. Hydrate formation has fascinated many scientists who have explored this field. In the United States a Presidential Advisory Panel recommended a program to investigate storage of CO_2 as a hydrate on the sea floor, and many quite imaginative descriptions of the possibility of this have been given.

Hydrate formation can occur at quite shallow depths. In Figure 1 I show the phase diagram for sea water with the shaded area indicating the zone at which hydrate formation can occur. Overlaid on this diagram is the temperature profile for the ocean off northern California, and we can

see that here pure CO_2 gas can be transformed into a hydrate at depths as

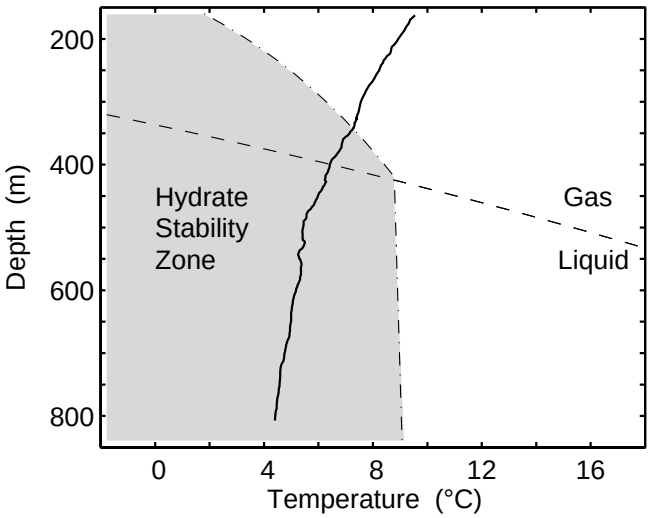

Figure 1: The phased diagram for CO_2 in sea water showing the hydrate phase boubary. A temperature profile for the ocean off northern California is overlaid.

shallow as about 325m. While the pure hydrate solid is more dense than sea water so far the CO_2-hydrate-seawater reaction product typically formed has a net buoyancy, and the material formed will rise and dissolve.

However liquid CO_2 has the property of very high compressibility, far higher than that of sea water. The result is that at great depth (about 3000m, or beyond an in situ density of about 1.043) CO_2 becomes denser than sea water and will sink. This offers possibilities of formation of a "lake" of CO_2 on the sea floor, and this idea has attracted much attention.

We know that CO_2 itself, and its hydrate, will dissolve in sea water. Thermodynamically we have to meet the condition of equality of chemical potentials, i.e. $\mu_{aq} = \mu_{gas} = \mu_{clath}$, and sea water is undersaturated with respect to CO_2.

The solubility of CO_2 in sea water, determined by Aya and co-workers in Japan, is extraordinarily high, approaching 7 weight per cent at 30Mpa, and thus CO_2 saturated sea water can be dense. Haugan and colleagues in Norway have proposed to use this excess density to generate a sinking plume of CO_2 rich sea water.

The discussion above assumes that a source of CO_2, extracted and concentrated from a fossil fuel system, has been made available. That step depends upon clean and efficient extraction procedures, and that process has yet to be developed. Direct reaction of combustion gases at moderate pressure with carbonate enriched sea water has also been suggested so as to circumvent the pure CO_2 extraction step.

From the brief survey given here it is clear that there are many scientific facets to this problem. Which ones are critical, and why?

Environmental effects.

Questions on the effects of CO_2 injection on marine biota arise early in any discussion of this topic. It is likely that only the near field region around an injection point will be critical since many marine animals experience, and are well adapted to, very large gradients in CO_2 (and oxygen) during daily vertical migration. For instance an animal migrating vertically in the North Pacific today will encounter a gradient of over 300 μmol in less than 1000m. Laboratory experiments have carried out, and early field work has been reported, which show that although strong responses occur at an injection point, these diminish very quickly with distance.

For disposal at depths greater than about 3000m we can form a "lake" of CO_2 on the sea floor, and the first experiments demonstrating this have now been successfully carried out. Here we would have concerns over benthic biology and sediment geochemistry.

For a rising plume of liquid CO_2 droplets the effective dissolution rate is about 3μmol/cm^2/sec, and control over injection technique and droplet size can minimize the impacted region. However it is unlikely that

completely pure CO_2 streams can be generated, and the effect of contaminants will have to be taken into account. The scale length of the plume will affect the range of isopycnal surfaces "labelled".

Dissolution of carbonate sediments, or migration of the lysocline will occur in response to CO_2 injection, and this has been elegantly modeled by Archer and colleagues. The restoration of the buffer capacity of sea water by this process is beneficial, but the process is slow compared to the rate of industrial change.

The tracer field.

We have learned much from the evolution of tracer fields in the ocean. The tracing of the nuclear test signals during the Geosecs program opened up new insights into ocean circulation and geochemistry in the 1970s. Today deliberate tracer injections of SF_6 have yielded insights into ocean mixing obtainable in no other way. The spread of a CO_2 tracer from a point source is directly comparable. Modeling of any proposed release would be essential, followed by float and tracer programs to observe the fate of the tracer cloud. These releases, which will require careful observation, can offer powerful tests of our predictive capability, and will provide new knowledge of ocean circulation.

Summary.

Within the next two decades society will make critical choices on how to respond to climate change, and on how to stem the growth of greenhouse gases in the atmosphere. Ocean disposal of CO_2 is one possible course of action. I believe that it is fair to say that at this time we have no unified body of knowledge of this topic. Yet this is a very achievable goal for the international ocean science community. Within the last few years this has become an active experimental science, with novel techniques and new insights. We have the opportunity to increase fundamental understanding, and to make powerful and original contributions to deep sea chemistry, physics and biology. I do not pre-judge whether this course of action will ultimately be seen as wise. But I do believe that it is important that those decisions be based upon sound scientific evidence, evidence that only the international ocean scientific community can provide.

ANNEX V

LIST OF WORKING DOCUMENTS

Document Code	Title	Agenda Items	Languages Available
WORKING DOCUMENTS			
IOC/EC-XXXIII/1	Agenda	2.1	E F S R
IOC/EC-XXXIII/1 Add.	Timetable	2.4	E only
IOC/EC-XXXIII/2	Action Paper	-	E F S R
IOC/EC-XXXIII/2 Annex 1	Progress Report on Budget Execution	3.2, 9.	E F S R
IOC/EC-XXXIII/2 Annex 1 Add.	Progress Report on Budget Execution Addendum	3.2, 9.	E only
IOC/EC-XXXIII/2 Annex 2	Proposed Revised Rules of Procedure	3.3	E F S R
IOC/EC-XXXIII/2 Annex 3	Report of the External Evaluation Team	3.4	E F S R
IOC/EC-XXXIII/2 Annex 4	Oceans 21 Development Plan	4.1.4	E F S R
IOC/EC-XXXIII/2 Annex 5	GIPME Programme Strategic Plan	4.1.5	E F S R
IOC/EC-XXXIII/2 Annex 6	Progress Report on the Implementation of the Storm Surges Proposal	4.2.2	E F S R
IOC/EC-XXXIII/2 Annex 7	Plan for an Intergovernmental Process for GCOS	4.3.4	E F S R
IOC/EC-XXXIII/2 Annex 8	Policy on Regional Programmes, Offices and Staffing – A Background Paper	4.4.6	E only
IOC/EC-XXXIII/2 Annex 9	Report on TEMA Coordination and Implementation	5.	E F S R
IOC/EC-XXXIII/3 Prov.	Draft Summary Report *(to be issued during the Session)*	11.	E F S R
IOC/EC-XXXIII/4 Prov. Rev.	Revised Provisional List of Documents *(this document)*	2.4	E F S R
IOC/EC-XXXIII/5 Prov.	Provisional List of Participants *(to be issued during the Session)*	-	E/F/S
REPORTS OF IOC AND COOPERATIVE BODIES REQUIRING ACTION			
IOC/INF-1136	Terms of Reference of a Joint SCOR-IOC Advisory Panel on Ocean CO_2	4.1.1	E only
IOC/INF-1133	CO_2 Disposal in the Oceans Abstract from *Science*, No. 284, pp. 934-945, 1999	4.1.1	E only
IOC/IPHAB-V/3	Summary of the Fifth Session of the IOC Intergov. Panel on HAB, Paris, 22-24 Nov. 1999	4.1.3	E only

Document Code	Title	Agenda Items	Languages Available
IOC/INF-1140	Summary Report of a Group of Experts on Sub-Marine Groundwater Discharges in the Coastal Zone	4.1.4	E only
IOC/INF-1144	Summary Report of the Meeting on Ocean Data Policy, UNESCO, Paris, 15-16 May 2000	4.2.1	E only
IOC/ITSU-XVII/3	Summary Report of the Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 4-7 October 1999	4.2.2	E
IOC-IHO/GEBCO-XVII/3	Summary Report of the 17th Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans, Dartmouth, 23-30 June 1999	4.2.3	E only
IOC/INF-1134	IGOS Oceans Theme Paper	4.3.1	E only
IOC/INF-1139	Partnership for Observation of the Global Oceans, Summary Report of the POGO Inaugural Meeting, La Jolla, 1-3 December 1999	4.3.1	E only
IOC/INF-1143	Continuity of High Accuracy Satellite Altimetry Through Jason-1 and Jason-2	4.3.1	E only
JCOMM Meeting Report No. 1	Summary Report of the First Transition JCOMM Planning Meeting – Report No. 1, St. Petersburg, 19-23 July 1999	4.3.2	E only
JCOMM Meeting Report No. 4	Summary Report of the Second Transition JCOMM Planning Meeting – Report No. 4, Paris, 14-16 June 2000		
IOC/INF-1138	Summary Report on a JCOMM/GOOS Polar Region Strategy, Geneva, 6-8 December 1999	4.3.2	E only
IOCINDIO-III/3s	Third Session of the IOC Committee for the Northern and Central Indian Ocean, Tehran, 21-23 February 2000 Executive Summary Report	4.4.1	E only
IOCEA-V/3s	Fifth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, May 2000 Executive Summary Report	4.4.2	E F
IOC/INF-1141	Report and Recommendations of the International Seminar on the Organization of UNESCO/IOC Project "Floating University in the Caspian Sea" (Astrakhan, Russia, 21-24 Nov. 99)	5. 4.4.4	E only
INFORMATION DOCUMENTS			
IOC Annual Report No.6	Report of the Executive Secretary IOC on Programme Execution (1999-2000)	3.	E only
IOC Annual Report No.6 Addendum	Implementation of IOC Governing Bodies Resolutions	3.	E F S R
IOC-XX/3	Summary Report of the Twentieth Session of the Assembly, Paris, 29 June – 9 July 1999	3.	E F S R

Document Code	Title	Agenda Items	Languages Available
IOC/EC-XXXII/3	Summary Report of the Thirty-second Session of the Executive Council, Paris, 28 June 1999	3.	E F S R
IOC/INF-785*	IOC Manual	3.3	E F S R
IOC/INF-785 Corr.	Revised Statutes of the Commission	3.3 & 3.1	E/F/S/R
IOC/INF-1137	"Conference Statement" of the First International Conference on the Ocean Observation System for Climate, St. Raphaël, October 1999	4.1.1	E only
Oceanography, Vol.12, No.3*	Census of Marine Life, The Oceanography Society Journal	4.1.2	E only
IOC/XXXIII/Inf-2	Executive Summary of the GEOHAB Science Plan	4.1.3	E only
HAN No. 20	Harmful Algae News, May 2000	4.1.3	E only
Workshop Report No. 166	IOC/SOA International Workshop on Coastal Megacities: Challenges of Growing Urbanisation of the World's Coastal Areas	4.1.4	E only
IOC Training Course 56	IOC-Sida Training Course on Rapid Assessment of Marine Pollurants (Draft Version)	4.1.5	E only
IOC/INF-1131	Project Proposal on Storm Surge Disaster Reduction for the Northern Part of the Indian Ocean, final version of October 1999, prepared by IOC, WMO and UNESCO-IHP	4.2.2	E only
IOC/INF-1124	Master Plan for the Tsunami Warning System	4.2.2	E F S
GOOS Newsletter*	GOOS Newsletters, No. 8 (Dec. '99) and 9 (Apr. 2000)	4.3	E only
IGOS Bulletin, No.1 & 2*	IGOS Bulletin, Sept. 1999 and March 2000	4.3	E only
IGOS Brochure*	IGOS Brochure 1999	4.3	E only
IOC-WMO-UNEP-ICSU/GSC-II/3	IOC-WMO-UNEP-ICSU Steering Committee for GOOS, Summary Report of the Second Session, Beijing, 26-29 April 1999	4.3.1	E only
IOC-WMO-UNEP/ I-GOOS-IV/3	Summary Report of the Fourth Session of IOC-WMO-UNEP for GOOS, Paris, 23-25 June 1999	4.3.1	E F
IOC-WMO-UNEP-ICSU/C-GOOS-III/3	Summary Report of the Third Session of IOC-WMO-UNEP-ICSU Coastal Panel of GOOS, Accra, 12-15 April 1999	4.3.1, 4.1.4	E only
IOC-WMO-UNEP-ICSU/LMR-GOOS-II/3	Summary Report of the Second Session of IOC-WMO-UNEP-ICSU Living Marine Resources Panel of GOOS, Montpellier, 22-24 March 1999	4.3.1	E only
GCOS-GOOS-WCRP/OOPC-IV/3	Summary Report of the Fourth Session of the Joint GCOS-GOOS-WCRP Ocean Observation Panel for Climate, Wood Hole, 17-20 May 1999	4.3.1, 4.3.4, 4.1.1	E only
IOC-WMO-UNEP-ICSU/AG-IOCARIBE-GOOS-I/3	Summary Report of the First Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Caracas, 3-5 November 1999	4.3.1	E only

Document Code	Title	Agenda Items	Languages Available
Workshop Report 158	The IOCARIBE Users and the Global Ocean Observing System (GOOS) Capacity Building Workshop, San Jose, 22-24 April 1999	4.3.1	E
Workshop Report 152	GOOS-AFRICA: Global Ocean Observing System for SICOM	4.3.1	E F
-*	Argo Brochure	4.3.2	E only
IOC/GE-GLOSS-VI/3	Summary Report of the Sixth Session of the Group of Experts on GLOSS, Toulouse, 12-14 May 1999	4.3.3	E only
IOC Training Course 54*	IOC Training Course for the Global Sea Level Observing System (PSMSL/GLOSS), São Paulo, Brazil, Sept. 1999	4.3.3	E only
IOC/INF-1135	Report (FCCC/SBSTA/1999/10) on Research And Systematic Observation: Issues Related to the Global Climate Observing System.	4.3.4	E only
Workshop Report No. 167	IOC-Flanders First ODINAFRICA-II Planning Workshop ((Summary)	4.4.3	E only
Floating University* Facility, Annual Report '99	Training-Through-Research Programme – Summary of the Activities of the UNESCO-MSU Research and Training Centre and the UNESCO Chair for Marine Geology and Geophysics	5.	E only
IOC/INF-1132	International Ocean Assessment Report	6.1	E only
IOC/INF-1114	Summary Report of an Informal Advisory Consultation on Implementation of IOC Assembly Resolution XIX-19, UNESCO, Paris, 2-3 Nov. 1998	6.2	E F
IOC/INF-1035	Summary Report of the First Session of the Open-Ended Intersessional Working Group on IOC's Possible Role in Relation to the UNCLOS	6.2	E F
--*	Report of the ACC-Sub-Committee of Ocean and Coastal Areas on its 8th Session, the Hague, 19-21 January 2000	7.1	E only
-	ACC-SOCA Brochure	7.1	E only
World Conference on Science – Declaration - Principal Documents Series, Budapest 1999*	Declaration on Science and the Use of Scientific knowledge: Science for the 21st Century, A new Commitment. World Conference on Science, Budapest, 26 June-1 July 1999	8.	E F S
IOC/EC-XXXIII/Inf-1	Information and Guidelines for Participants	-	E only
IOC/EC-XXXIII/Inf-2	IOC-SCOR Programme on the GEOHAB – Executive Summary of the Science Plan and Overview of Science Plan Elements	4.1.3	E only
IOC Technical Series 55	Bruun Memorial Lecture, 1999 – "Ocean Predictability" by J. Woods		E only

* 1 copy per delegation

ANNEX VI

LIST OF PARTICIPANTS

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ANNEX VII

NATIONAL REPORTS

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Forewords

National activities in the field of physical oceanography have grown considerably to reach an excellent and competitive standard, thanks mainly to a wide participation in the EU MAST (Marine Science and Technology Programme) (1994-1998). Efforts made at a national level by the National Committee for the Research and Development of Nuclear and Alternative Energies "ENEA" together with "PNRA" (National Programme for Antarctic Research), the National Research Council "CNR" and the Ministry for University and Scientific and Technological Research "MURST" through the "PRISMA" (Research and Experimental Programme for the Protection of the Adriatic Sea) have raised the level of this sector in both experimental, and process and modelling oriented studies.

Very high-level scientific results have been obtained in the following fields:

- Regional studies (the Adriatic Sea and the major Mediterranean Straits);
- The general circulation of the Mediterranean Sea;
- Climatic studies, in particular in the Antarctica and in the Mediterranean;
- The development and exploitation of high technology for marine investigation.

For every one of these activities, efforts have been made not only on an experimental basis, but also with modelling studies. This interrelation between experiments and models is now strategic for the development of marine forecasting systems through operational oceanography, which is the most challenging issue for oceanography in the near future. In this context, the active role of Italy in promoting and supporting GOOS (Global Ocean Observing System) and EuroGOOS at both national and international level must be mentioned.

Strategic plans for marine research in Italy in the next future are mainly addressed to:

- The establishing of an Italian component of the GOOS;
- The sustainable development of the coastal zone;
- The creation of a National Research Programme for climate studies.

The international references are among others: the World Climate Research Programme (WCRP), the Global Energy and Water Cycle Experiment (GEWEX), the Global Climate Observing System (GCOS), the GOOS and the coastal panel for GOOS.

On these activities, specific research plans are proposed as national or international projects to be recognized as implementation plans by international bodies. The priority goes to the following two pilot projects:

1) The establishment of a permanent observation system for the Italian seas and the Mediterranean

The main objectives are:

- To contribute directly to the GOOS;
- To develop links between Italian industries for the development of low-cost monitoring instrumentation;
- To set up a forecasting system for the Mediterranean ecosystem.

The programme will be implemented through the following tasks:

1. To set up an integrated system of measurements based on satellites, ships-of-opportunity and moored stations in order to monitor the variability of the Mediterranean basins;
2. To develop a forecasting system;
3. To increase the skill of the existing ecological models in order to predict changes in the bio-geo-chemical processes;
4. To develop a coupled air-sea interaction model to improve the meteorological forecasts in the Mediterranean region.

Other products will be the creation of a common database at the Mediterranean level and the creation of a network of fixed moored stations (buoys and platforms) in the region. These two items will be proposed to be funded by EU under the V FP.

2) A multidisciplinary study to assess methodologies and policy options for sustainable management of the Adriatic Sea

The objectives of the project aim at understanding and modelling the impact of human activities on marine primary production as well as estimating its social costs and identifying the policy options. In particular, present state conditions will be evaluated through an intensive historical data collection and its retrospective analysis through statistical and numerical methods. The knowledge of the main sources of pollutants of terrestrial origin and the physical and biological dynamics of the basin reproduced by a model will be integrated so as to offer an affordable (basically numerical) tool to the management and policy option studies. This methodological approach will be applied with historical and existing data to describe conceptually and implement the food web functioning in the Adriatic, to appraise its relationship with the benthic community through the benthic-pelagic coupling and try to include also the extreme events with strong socio-economical impact such as the slime or mucilage.

A number of **Major Issues** were identified during an international workshop held in Rovinji (Croatia) on October 17-23, 1999. These include:

- **Oxygen**
- **Harmful Algae Blooms**
- **Mucilage**
- **Fish Abundance**

The key elements of each issue are given below. For each issue there is a set of key questions and a set of research questions that are not listed here, but that will drive future research.

Issue 1: Oxygen

The formation of an hypoxic bottom layer in the northern Adriatic Sea with O_2 concentrations less than 30% of saturation commonly occurs toward the end of summer and in early fall. Bottom water anoxia has affected coastal and basin areas of several thousand square kilometres of the northern Adriatic Sea in some years. For example, major anoxic events occurred in the basin during the fall 1977 following unusual high freshwater discharges in spring, and in mid November 1989 during a prolonged calm period. It is widely believed that hypoxia is the combined result of high nutrient loading to the system that drives phytoplankton production, and of physical circulation and insufficient flushing rate to isolate the near bottom water mass. Recent and historical observations show that large areas may become hypoxic or anoxic with an ensuing mass mortality of benthic organisms and the migration of benthic fish. Despite these observations, the extent and duration of hypoxia in the northern Adriatic Sea are not well described. Some suggestions based on limited data propose that a trend in O_2 toward worsening conditions has accompanied eutrophication of the system, but the findings are equivocal and are based on sparse data. It is clear that the main limitation to specify the severity of the O_2 problem is one of sampling and that monitoring on appropriate time and space scales for key variables, including and especially dissolved O_2, is a critical ingredient. It follows that, lacking adequate information to assess the severity of the O_2 problem, it is impossible to define the extent to which hypoxic episodes influence the biota.

Issue 2: Harmful Algal Blooms (HABs)

Occurrences of harmful algal blooms (HABs) in the Adriatic Sea include both toxic and non-toxic forms of dinoflagellates. In the toxic group, several recent outbreaks have exacted serious effects on specific regions along the western coast by affecting mussels in commercial culture. The causative organism is *Dinophysis* sp., a dinoflagellate that produces diarrhetic shellfish poisoning (DSP) in humans ingesting contaminated shellfish. Low concentrations of *Dinophysis* sp. of approximately 200 cells l^{-1} are sufficient to cause DSP problems, a situation analogous to *Pfiesteria piscicida* in US waters that has toxic effects on fish at very low cell abundances. Non-toxic HABs may affect the Adriatic Sea by influencing local water quality and by contributing to hypoxic episodes. There are a number of species whose populations reach sufficient size in the Adriatic Sea to exert non-toxic but harmful effects on the ecosystem, the frequency and extent of which are unknown. Systematic regional monitoring needs to focus on defining the extent of HAB problems in the Adriatic Sea, including those associated with both toxic and non-toxic taxa. Research should consider the development of new tools for detecting harmful taxa, including molecular probes, and assess the extent to which nutrient enrichment of the system is yielding an increased frequency and extent of HABs. Essential elements of modelling and research components directed at furthering our understanding of HABs in the Adriatic Sea include:

Issue 3: Mucilage

The formation of mucilage in the N. Adriatic Sea, a phenomenon historically known as "mare sporco", is believed to be associated with the production of extra cellular polysaccharides by diatoms. These events generally occur during summer following spring blooms, generally dominated by diatoms, during which nutrients are depleted, particularly P compounds, resulting in the production of large quantities of polysaccharides. An important role of bacterioplankton in the accumulation of refractory gel-like matrix, and then of large mucilaginous aggregates, was also hypothesized. During this phase of mucilage development, the matrix mainly accumulates in the pycnoclines (haloclines), where the largest concentrations of aggregates have also been observed. However, in condition of prolonged calm sea, dense gelatinous layer can also be formed. During

late summer, large aggregates of mucus, algae and bacteria sink to the bottom, often with lethal consequences for sedentary species of the benthos. The aggregates in the water column impede fishing, and the impact of the mucilaginous material on the coast cause serious damages to the tourist industry. Essential environmental conditions for the formation of mucilage and its accumulation to nuisance levels include the development of "closed" circulation, such as accompanies summer formation of an anticyclonic gyre and stable vertical stratification of the water column. Mucilage outbreaks in the northern Adriatic have been reported in the scientific literature 11 times in the period 1872-1930, dating back to occasional observations in 1729 AD. Severe episodes of mucilage formation have occurred again recently in the period 1988-1991 and in 1997, and it has been hypothesized that the balance of N and P in nutrient loads to the northern Adriatic contributes to an increased frequency of *mare sporco*.

Issue 4: <u>Fish Abundance</u>

The Adriatic Sea supports extensive and economically viable fisheries. In recent years annual landings have been about 100,000 tons (~50 kg ha^{-1} yr^{-1}). The regression of fish yield on primary production by Nixon (1988) predicts a yield of 10 kg ha^{-1} yr^{-1} for the Adriatic, indicating actual fish harvest is quite high. This may in part be explained by the dominance of the fishery by clupeoid fish that occupy a low trophic level. Nonetheless, this statistic is cause for concern. We suggest that the sustainability of the fisheries is threatened by over fishing relative to production, high nutrient loads, reduced water quality, and changes in production dynamics. The connections of nutrient loads, water quality, and fish production are poorly understood, however it is essential that information needed to manage and sustain viable fisheries be acquired.

3) Climate Studies

The major priorities in the field of marine research which are relevant for the climate studies have been identified within the Italian National Programme for Climate Studies 1999-2001. These are:

- The variability of the deep circulation of the Mediterranean and the relationship between the dynamics of the Mediterranean Sea and the North Atlantic Oscillation (NAO);
- The risk analysis of the coastal zone of the northern Adriatic Sea (in particular the lagoon of Venice) taking into account the sea level rise expected in the next future;
- The necessity of a national data base of all the data relevant for climatic studies;
- The need of a computing centre for numerical simulation with the aim of performing scenario analysis related to global change effect in the Mediterranean Region;
- To establish an Italian focal point for the Intergovernmental Panel on Climate Change.

MÉXICO

INFORME SOBRE LAS ACTIVIDADES

INTRODUCCIÓN. MÉXICO EN LOS ACUERDOS Y TRATADOS INTERNACIONALES SOBRE EL OCÉANO

Para México, es una actividad prioritaria la cooperación internacional con organizaciones gubernamentales y no gubernamentales para la protección de los recursos naturales y los ecosistemas marinos y costeros. Así, la siguiente relación de algunos de los acuerdos y organismos internacionales en los que participa, muestra el grado de compromiso que el país asume en este ámbito (1):

Código de Conducta para la Pesca Responsable. Este instrumento fue propuesto por México en 1992 y aprobado en el marco de la FAO. Actualmente se promueve la aplicación de sus principios por medio de programas de cooperación con naciones de Centroamérica y del Caribe.

Comisión Ballenera Internacional. En esta Comisión se mantiene una posición en favor de la protección de las ballenas y de la continuación de la moratoria a su captura comercial hasta que no se cuente con las herramientas de carácter científico que permitan determinar las posibilidades de su levantamiento.

Convención de las Naciones Unidas sobre el Derecho del Mar (CONVEMAR). México ratificó este instrumento en 1983.

Comisión Internacional para la Conservación del Atún Atlántico (CICAA). A pesar de no ser miembro de esta Comisión, México participa en calidad de observador y de manera general aplica las recomendaciones para la conservación de las distintas especies que son reguladas por dicha organización.

Comisión Interamericana del Atún Tropical (CIAT). Se participa en calidad de observador en esta Comisión y se aplican las medidas de administración para la conservación del atún aleta amarilla en la zona del Pacífico Oriental.

Comité de Pesca de la FAO. Actualmente se participa en las acciones que lleva a cabo este Comité para la formulación de Planes de Acción para la protección del tiburón, la reducción de la captura incidental de aves marinas en la pesca de palangre y el manejo de la capacidad de pesca.

Acuerdo sobre el Programa Internacional para la Protección y Conservación de los Delfines. Desde 1993 México participa en un acuerdo regional de carácter voluntario para proteger a los delfines en la pesca del atún (Acuerdo de La Jolla). En 1998 ese Acuerdo fue firmado por 8 países, incluyendo a México, con carácter obligatorio.

Convención sobre el tráfico internacional de especies amenazadas de flora y fauna (CITES). México se incorporó en 1993 a esta convención y se ha trabajado en la instrumentación de acuerdos relativos a tortugas marinas, mamíferos marinos, cocodrilos y caimanes entre otros.

Acuerdo para promover el cumplimiento de las medidas internacionales de conservación y ordenación para los buques pesqueros que pescan en alta mar (Acuerdo de Abanderamiento). México participó activamente en las negociaciones de este instrumento y lo ratificó en enero de 1999.

Convenio sobre la prevención de la contaminación del mar por vertimientos de desechos y otras materias. México es parte contratante de este Convenio desde el 7 de abril de 1975.

Convenio internacional para prevenir la contaminación por los buques y otras fuentes de contaminación marina (MARPOL 73/78). El gobierno de México es parte de MARPOL 73/78 desde el 23 de julio de 1992, así como de los Anexos I, II y V.

Programa de acción mundial para la protección del medio marino frente a las actividades basadas en tierra del programa de las naciones unidas para el medio ambiente (PNUMA). México participa en este programa dentro del Acuerdo de Cooperación Ambiental para América del Norte (ACAAN), desarrollando con Estados Unidos de América un proyecto piloto para el manejo integrado de la zona costera en la región fronteriza.

México está integrado a la **Convención Relativa a los Humedales de Importancia Internacional (RAMSAR).** En este marco se ha realizado el mapa de los humedales de México habiéndose identificado 32 humedales prioritarios para su conservación. México participa también en el **Convenio sobre Diversidad Biológica.** En 1998 publicó el documento "La diversidad biológica de México. Estudio de País" (2) para dar cumplimiento a las disposiciones del artículo 6o. del propio Convenio.

Iniciativa Internacional sobre Arrecifes Coralinos (ICRI) y Red Mundial de Monitoreo de Arrecifes Coralinos. México participa en las actividades de estos acuerdos. Se está promoviendo la creación de un área natural protegida regional sobre el Sistema Arrecifal del Caribe Mesoamericano en el que intervienen los gobiernos de Belice, Guatemala, Honduras y México. Con esa área se busca proteger la segunda barrera coralina de mayor importancia en el mundo por su diversidad biológica, con una extensión aproximada de mil kilómetros e impedir su deterioro y pérdida de biodiversidad.

ACTIVIDADES

El Plan de Trabajo del Subcomité de México para la Comisión Oceanográfica Intergubernamental establece como actividades prioritarias las de coordinación y articulación de las instituciones de enseñanza e investigación y dependencias gubernamentales relacionadas con las ciencias del mar para la suma de recursos y esfuerzos en el desarrollo de los proyectos nacionales para incorporarlos a los programas de la COI.

Floraciones de Algas Nocivas (FAN, HAB).

México participa como Coordinador Regional de este proyecto de IOCARIBE. Se ha elaborado el Plan para el desarrollo del proyecto en México. Se pretende realizar el Primer Curso de Entrenamiento de IOCARIBE sobre Algas Nocivas a finales de este año en La Paz, B.C.S., México. Además del Centro de Investigaciones Biológicas del Noroeste (CIBNOR) y la Dirección General de Educación en Ciencia y Tecnología del Mar (DGECyTM) se han incorporado al proyecto, la Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP), la Procuraduría Federal de Protección al Ambiente (PROFEPA), el Instituto Nacional de la Pesca (INP), el Instituto de Ciencias del Mar y Limnología (ICMyL) de la UNAM y el Centro de Investigación y Estudios Avanzados (CINVESTAV) del IPN. La DGECyTM continúa proporcionando equipamiento para complementar la infraestructura de las escuelas que participan en el proyecto tanto en el Pacífico como en el Golfo de México. En breve se establecerá una página web. El proyecto ha sido propuesto para financiamiento dentro de los Proyectos de Participación de la UNESCO para el bienio 2000-2001.

Cartografía Oceánica. Carta Batimétrica Internacional del Mar Caribe y Golfo de México (IBCCA).

México desempeña el cargo de Presidente del Comité Editorial de IBCCA. A la fecha se ha integrado una proporción importante de la información de la Carta. Se han publicado 2 de las 17 hojas en la versión impresa. El resto de las hojas no se han publicado por no haberse contado aún con los recursos necesarios para ese fin. La versión digital comprenderá 3 discos compactos (CD's) el primero de los cuales se espera será liberado a finales del presente año. Los otros 2 CD's aparecerán durante los próximos 2 años. Este proyecto ha sido propuesto para financiamiento dentro de los Proyectos de Participación de la UNESCO para el bienio 2000-2001.

Gran Ecosistema Marino del Pacífico Costero de América Central (GEMPCAC).

Atendiendo la recomendación SC-IOCARIBE-VI.5 en la que se decidió apoyar un proyecto para monitorear y evaluar el Gran Ecosistema Marino del Pacífico Costero de América Central y sus recursos, se inició este proyecto a partir de abril de 1999 bajo la coordinación regional de México. Se han realizado encuentros con representantes de los países involucrados en la zona del GEMPCAC y se tiene el acuerdo de la agencia gubernamental de México, la SEMARNAP para apoyar la solicitud de fondos a PNUD para la implementación del proyecto. Se presentó también a SIDA/SAREC una solicitud de apoyo para llevar a cabo una reunión de expertos internacionales para orientar la formulación del proyecto GEMPCAC y se ha integrado el Comité Coordinador con el Dr. Manuel Murillo (Costa Rica), el Dr. Antonio Díaz de León (México) y el Dr. Keneth Sherman (USA).

Plan Regional Estratégico de Ciencias 2000-2001 de IOCARIBE.

Atendiendo la Recomendación SC-IOCARIBE-VI.10 de IOCARIBE V, para la formulación de un Plan Estratégico de Ciencias y Servicios Relacionados a mediano plazo (2000-2010) se llevó a cabo la Primera Reunión del Grupo de Expertos en Veracruz, Ver. del 1 al 3 de diciembre de 1999 con el apoyo de la Dirección General de Educación en Ciencia y Tecnología del Mar (DGECyTM) y de la COI. Se elaboró el documento "Guía Propuesta para el Plan Estratégico de Ciencias 2000-2010" (3), con base en el cual se formulará el Plan en la siguiente reunión del grupo.

Sistema de Alerta contra los Tsunamis en el Pacífico (ITSU).

México participa en este proyecto a través de investigadores del Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE). Se pretende elaborar los mapas de patrones de inundación y flujos de agua de la costa occidental del país para el caso de que ocurran tsunamis en esa región.

CLIVAR México (4).

El gobierno de México ha reconocido la importancia de la variabilidad climática y ha iniciado el establecimiento de acciones para mitigar los efectos de las condiciones climáticas extremas, a partir de su participación en la Conferencia CLIVAR de diciembre de 1998 en la que se presentó CLIVAR México. El programa nacional se desarrollará siguiendo estrechamente los lineamientos de CLIVAR. Alrededor de 10 instituciones de investigación y dependencias gubernamentales se están incorporando al programa nacional. El interés científico de la comunidad de climatólogos de México coincide con los objetivos de CLIVAR. En particular, existe interés en realizar investigación sobre los procesos físicos responsables de la variabilidad climática a nivel regional y la predicción del clima en varias escalas de tiempo, se busca ampliar el rango y la exactitud de los

modelos climáticos regionales y entender y proyectar la respuesta del sistema climático al aumento en la atmósfera de la cantidad de gases con efecto de invernadero y de los aerosoles.

Proyecto de Red de Boyas Oceanográfica-Meteorológicas en el Pacífico Mexicano.

Varias instituciones nacionales como el Centro de Investigaciones Biológicas del Noroeste y el Centro de Investigación Científica y de Educación Superior de Ensenada, B. C. han manifestado su intención de establecer una Red de Boyas Oceanográfico-Meteorológicas en la zona del Istmo de Tehuantepec y del Pacífico Tropical Mexicano, en la que podrían participar el Instituto de Ciencias de la Atmósfera de la UNAM y el Programa Eastern Pacific Investigation of Climate (EPIC).

Red Nacional de Investigadores y Directorio Nacional de Instituciones y Organismos Gubernamentales relacionados con las Ciencias del Mar

Como resultado de un acuerdo del Subcomité de México para la COI se estableció la Red Nacional de Investigadores y el Directorio Nacional de Instituciones y Organismos Gubernamentales relacionados con las Ciencias del Mar. Esta Red tiene como objetivo facilitar y promover la comunicación y el intercambio de información entre los profesionales y entre las instituciones de educación, investigación y servicios en ciencias del mar. El Instituto Nacional de Estadística, Geografía e Informática (INEGI), miembro del Subcomité fue el encargado de recopilar la información, de diseñar la base de datos y de publicarla en la Internet (http://www.inegi.gob.mx/territorio/espanol/fterritorio.html).

Proyecto para la Normalización y Estandarización de los Datos Oceanográficos de México.

En el ámbito del Subcomité de México para la COI, el Instituto Nacional de Estadística, Geografía e Informática (INEGI) ha propuesto este proyecto cuyo objetivo es el de normalizar y estandarizar el proceso de generación de los datos oceanográficos obtenidos en las aguas jurisdiccionales de México. Se pretende utilizar el formato GF-3 elaborado por IODE con lo cual se facilitaría el intercambio de información a nivel nacional e internacional.

Proyecto de Red Oceanográfica Mexicana.

La creación en México de la Red Oceanográfica Mexicana, propuesta que ha sido promovida por el Centro de Investigación Científica y de Educación Superior de Ensenada, B. C. junto con las instituciones de investigación más importantes del país, y recientemente ha obtenido apoyo del Consejo Nacional de Ciencia y Tecnología de Mexico (CONACyT). Esta Red, puede tener una gran importancia en el país, dado que está integrada por las principales instituciones de investigación de México y por el sector pesquero, bajo el patrocinio del CONACyT.

EXTENSIÓN DEL AÑO INTERNACIONAL DEL OCÉANO

Para continuar atendiendo la propuesta del documento IOC-XX/2, anexo 9, en el sentido de desarrollar nuevas actividades como una extensión del Año Internacional del Océano, se realizaron los siguientes eventos:

- **Educación y Desarrollo Sustentable.** En el mes de enero del presente año, se impartió un curso sobre "Educación Ambiental y Desarrollo Sustentable" en el puerto de Veracruz, Ver. a maestros de todos los planteles de la Dirección General de Educación en Ciencia y Tecnología del Mar (DGECyTM) que es el organismo que imparte educación en ciencia y tecnología del mar a nivel nacional (http://uecytm.sep.gob.mx). Se elaboró un plan para llevar a cabo la

modificación de los Planes y Programas de Estudio de todas las carreras para incorporar el enfoque del desarrollo sustentable.

- **Programa QUETZALATL para el uso inteligente y racional del agua.** La Secretaría de Educación Pública organizó un Programa Nacional Educativo sobre el Uso Inteligente y Racional del Agua. En la Dirección General de Educación en Ciencia y Tecnología del Mar (DGECyTM) en particular, este programa asumió el nombre de Programa de Educación Ambiental ***Quetzalatl*** que en lengua náhuatl significa *aguas preciosas*. Mediante ese programa se convocó a todos los planteles, a nivel nacional, a desarrollar programas locales de actividades. El desarrollo de *Quetzalatl* se inició en 1999 y tendrá carácter permanente. A través de él se promueve el estudio y cuidado sistemáticos de las cuencas hidrográficas de cada región con la participación de brigadas de niños quienes han desarrollado actividades de educación ambiental sobre el uso del agua.

- **Ampliación del Programa QUETZALATL.** En el mes de mayo de 2000, durante la celebración del evento VIII INTERTECMAR en el que participaron 1200 estudiantes y 212 profesores de carreras de ciencia y tecnología del mar de todo el país, ante el éxito del Programa *Quetzalatl*, se ampliaron sus actividades iniciando una campaña de recolección y procesamiento de basura.

- **Exposición itinerante ¿ Conoces del mar ?** La exposición itinerante ¿Conoces del mar ?, del huanacaxtle a la fibra de vidrio", después de haber sido presentada en la ciudad de México y en Veracruz, Ver., se trasladó al puerto de Mazatlán en donde permaneció del mes de julio al mes de noviembre de 1999.

- **Memoria del Año Internacional del Océano.** Se publicó el libro "Memoria del Año Internacional del Océano en la República Mexicana" (5) en el que se resumen las actividades realizadas durante el año de 1998.

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ANNEX VIII

LIST OF ACRONYMS

(with hyperlinks)

ABE-LOS	Advisory Body of Experts on the Law of the Sea
ABLOS	Advisory Board on Hydrographic, Geodetic and Marine Geo-Scientific Aspects of the Law of the Sea
ACC-SOCA	Administrative Committee on Coordination – Sub-Committee on Oceans and Coastal Areas
ADB	African Development Bank
ALECSO	Arab League of Education, Culture and Science Organization
AMETEC	Marine Environmental Training and Education Centre (see APEC)
APEC	Asia-Pacific Economic Cooperation Council
Argo	Array for Real-time Geostrophic Oceanography
BASYS	BAltic Sea SYstem Study
BENEFIT	Benguela Environment Fisheries Interaction and Training
Black SeaGOOS	Black Sea regional GOOS
BOOS	Baltic Operational Oceanographic System (Baltic GOOS)
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CBS	Commission for Basic Systems (WMO)
CEP	Caspian Environmental Programme
CGMS	Coordination Group for Meteorological Satellites
CGOM	Consultative Group Ocean Mapping
CIDA	Canadian International Development Agency
CIESM	International Commission for the Scientific Exploration of the Mediterranean Sea
CLCS	Commission on the Limits of the Continental Shelf
CLIVAR	Climate Variability and Predictability
CMM	Commission for Marine Meteorology (WMO) (see JCOMM)
CMSLT	Commission on Mean Sea Level and Tides (see IAPSO)
CNES	Centre national d'études spatiales (France)
CNR	National Research Council (Italy)
COASTS	Inter-disciplinary Study of Coastal Processes Programme
CODATA	Committee on Data for Science and Technology (ICSU)
COP	Conference of the Parties
CSD	Commission on Sustainable Development
CSTR	Committee of Scientific and Technical Research (OAU)
DBCP	Data Buoy Cooperation Panel
DFID	Department for International Development (UK)
DOALOS	Division for Ocean Affairs and the Law of the Sea (UN)
DOSS	*Ad hoc* Study Group on IOC Development, Operations, Structure and Statutes
EC	European Commission
EEZ	Exclusive Economic Zone
ENAM	European North Atlantic Margin Project (EU)
ENEA	National Committee for the Research and Development of Nuclear and Alternative Energies (Italy)
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)
EU	European Union
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
EURASLIC	European Aquatic Sciences and Libraries and Information Centres
EuroGOOS	European GOOS
FAO	Food and Agriculture Organization (UN)

GCOS	Global Climate Observing System
GDA	GEBCO Digital Atlas
GEBCO	General Bathymetric Chart of the Oceans
GEF	Global Environment Facility
GEOHAB	Global Ecology and Oceanography of Harmful Algal Blooms
GEOSTAR	GEophysical and Oceanographic STation for Abyssal Research
GESAMP	Group of Experts on the Scientific Aspects of Marine Pollution
GEWEX	Global Energy and Water Cycle Experiment
GGE	GLOSS Group of Experts
GIPME	Global Investigation of Pollution in the Marine Environment
GIWA	Global International Water Assessment
GLOBEC	Global Ocean Ecosystems Dynamics
GLOSS	Global Sea-Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GOG	Gulf of Guinea Large marine Ecosystem Project
GOOS	Global Ocean Observing System
GOOS-AFRICA	African Global Ocean Observing System
GOOS-IOS	GOOS Initial Observing System
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
GPO	GOOS Project Office
GSC	GOOS Steering Committee
GTOS	Global Terrestrial Observing System
HAB	Harmful Algal Blooms
HELCOM	Baltic Marine Environment Protection Commission/Helsinki Commission
IACSD	Inter-Agency Committee on Sustainable Development
IAEA	International Atomic Energy Agency
IAMSLIC	International Association of Aquatic and Marine Science Libraries and Information Centres
IAPSO	International Association for the Physical Sciences of the Ocean (IUGG)
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic (IOC)
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
ICAM	Integrated Coastal Area Management
ICES	International Council for the Exploration of the Sea
ICG/ITSU	International Coordination Committee for the Tsunami Warning System in the Pacific
ICM	Integrated Coastal Management
ICSPRO	Inter-secretariat Committee on Scientific Programmes Relating to Oceanography (UN-FAO-UNESCO-WMO-IMO)
ICSU	International Council for Science
IDNDR	International Decade for Natural Disaster Reduction (1989-1999)
IFREMER	Institut français de recherche pour l'exploitation de la mer
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGOS	Integrated Global Observing Strategy
IGOS-P	Integrated Global Observing Strategy Partnership
IGOSS	Integrated Global Ocean Services System
IGST	International GODAE Steering Team
IGU	International Geographical Union
IHDP	International Human Dimensions Programme (on Global Environmental Change) *(Other link: IHDP)*
IHO	International Hydrographic Organization
IHP	International Hydrological Programme (UNESCO)

IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOCARIBE	IOC Sub-commission for the Caribbean and Adjacent Regions
IOCEA	IOC Regional Committee for the Central Eastern Atlantic
IOCINCWIO	IOC Regional Committee for the Cooperative Investigations in the North and Central Western Indian Ocean
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IOCSOC	IOC Regional Committee for the Southern Oceans
IODE	International Oceanographic Data and Information Exchange (IOC)
IOI	International Ocean Institute
IOMAC	Indian Ocean Marine Affairs Cooperation
IPHAB	IOC Intergovernmental Panel on Harmful Agal Blooms
IPO	International Programme Office (GEOHAB)
IRD	Institut français de recherche scientifique pour le développement en coopération (ex ORSTOM)
ISA	International Seabed Authority
ISDR	International Strategy on Disaster Reduction
ITIC	International Tsunami Information Centre
ITLOS	International Tribunal for the Law of the Sea
ITSU	International Coordination Group for the Tsunami Warning System in the Pacific (IOC)
IUCN	International Union for the Conservation of Nature (and Natural Resources) [World Conservation Union]
IUGG	International Union of Geodesy and Geophysics (ICSU)
IUHPS	International Union of the History and Philosophy of Science
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology (WMO-IOC)
JCOMMOPS	JCOMM Operations Centre
JICA	Japan International Cooperation Agency
JSPS	Japan Society for the Promotion of Science
KMFRI	Kenya Marine & Fisheries Research Institute
KOICA	Korean International Cooperation Agency
LME	Large Marine Ecosystems
LOICZ	Land-Ocean InteractionS in the Coastal Zone (ICSU/IGBP)
MAB	The Man and the Biosphere Programme (UNESCO)
MAMCOMP	Training Programme on Modelling and Monitoring of Coastal Marine Processes
MAP/UNEP	Mediterranean Action Plan of the United Nations Environment Programme
MAST	Marine Science and Technology Programme
MBARI	Monterey Bay Aquarium Research Institute
MED POL	Programme for the Assessment and Control of Pollution in the Mediterranean region
MedGOOS	Mediterranean regional GOOS
MEDS	Marine Environmental Data Service (Canada)
MOST	Management of Social Transformations Programme
MoU	Memorandum of Understanding
MTP II-MATER	Mediterranean Targeted Project II – MAss Transfer and Ecosystem Response (EU/MAST)
MURST	Ministero dell'Università e della Ricerca Scientifica e Tecnologica (Ministry for University and Scientific and Technological Research (Italy)
NAO	North Atlantic Oscillation
NASA	National Aeronautics and Space Administration (USA)

NAVO(CEANO)	Naval Oceanographic Office (USA)
NEAR-GOOS	North-East Asian Regional GOOS
NGO	Non-Governmental Organizations
NOAA	National Oceanic and Atmospheric Administration (USA)
OAU	Organization of African Unity
OBIS	Ocean Biogeographical Information System
OCEANOBS'99	First International Conference on Ocean Observations for Climate
ODAS	Ocean Data Acquisition System
ODINAFRICA	Ocean Data and Information Network for Africa (IOC-Flanders)
ODINEA	Ocean Data and Information Network for Eastern Africa
OECD	Organization for Economic Cooperation and Development
OGS	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
OMEX	Ocean Margin EXchange project (EU)
ONR	Office of Naval Research (US Navy)
OOPC	Ocean Observation Panel for Climate
OSLR	Ocean Science in Relation to Living Resources
OSPAR Convention	Convention for the Protection of the Marine Environment of the North-East Atlantic (1992)
OSPAR Commission	Commission established by Article 10.1 of the OSPAR Convention
PacificGOOS	Pacific regional GOOS
PACSICOM	Pan-African Conference on Sustainable Integrated Coastal Management (Maputo, Mozambique, 18-25 July 1998)
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea & Gulf of Aden
PICES	North Pacific Marine Science Organization (Pacific ICES)
PIRATA	PIlot Research Array (of buoys) in the Tropical Atlantic
PNRA	Programma Nazionale di Richerche in Antartide (Italian National Research Programme in Antarctic)
POGO	Partnership for Observation of the Global Ocean
POPs	Persistent Organic Pollutants
PRISMA	Research and Experimental Programme for the Protection of the Adriatic Sea (Italy)
PSMSL	Permanent Service for Mean Sea-Level
PTWC	Pacific Tsunami Warning Centre
RAMP	Rapid Assessment of Marine Pollution
RECOSCIX-CEA	Regional Cooperation in Scientific Information Exchange for the Central Eastern Atlantic (see ODINAFRICA)
ROPME	Regional Organization for the Protection of the Marine Environment
SAP	Strategic Action Plan
SAREC	Swedish Agency for Research Cooperation with Developing Countries
SBSTA	Subsidiary Body for Scientific and Technological Advice (see UNFCCC)
SCAR	Scientific Committee on Antarctic Research (ICSU)
SCOPE	Scientific Committee on Problems of the Environment (ICSU)
SCOR	Scientific Committee on Oceanic Research
SGD	Sub-marine Groundwater Discharges
SIDA	Swedish Development Agency
SOA	State Oceanic Administration of China
SOOP	Ship-of-Opportunity Programme
SOPAC	South Pacific Applied Geoscience Commission
SSG	Scientific Sub-Group
STRATAGEM	Statigraphical Development of the Glaciated European Margin (EU supported programmes)

TAO	Tropical Atmosphere Ocean Array
TEMA	Capacity Building in Marine Sciences, Services and Observations
TIME	Tsunami Inundation Modelling Exchange
TOGA	Tropical Ocean and Global Atmosphere
TTR	Training-Through-Research Programme [see Floating University]
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNITWIN	UNESCO Chairs Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNICPOLOS	United Nations open-ended Informal Consultative Process on Oceans and the Law of the Sea
UNIDO	United Nations Industrial Development Organization
UOP	Upper Ocean Panel (CLIVAR)
WADB	West African Development Bank
WAEMU	West African Economic and Monetary Union
WCP	World Climate Programme
WDC	World Data Centre
WESTPAC	IOC Sub-commission for the Western Pacific
WHC	World Heritage Centre (UNESCO)
WIOMAP	West Indian Ocean Marine Applications Programme
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment
WWW	World Wide Web (Internet)
WWF	World Wide Fund for Nature
WWW	World Weather Watch (WMO)