

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

**IOC Sub-Commission
for the Caribbean
and Adjacent Regions**

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In this Series

Languages

Reports of Governing and Major Subsidiary Bodies, which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:

1. Eleventh Session of the Working Committee on International Oceanographic Data Exchange E, F, S, R
2. Seventeenth Session of the Executive Council E, F, S, R, Ar
3. Fourth Session of the Working Committee for Training, Education and Mutual Assistance E, F, S, R
4. Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment E, F, S, R
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1. OPENING

1 The meeting was opened at 10:30 hrs, 2 December 1992, at Hotel Howard Johnson, Veracruz, Mexico.

2 Lic. Arturo Salcido-Beltran "Coordinador del Subcomite de la COI para la CONALMEX para la UNESCO", addressed the plenary highlighting the importance of the present Session of the Sub-Commission and the need for a strong participation of Member States in the region. He described the overall context of marine sciences and related economic activities in Mexico and elaborated on associated elements of Training, Education and Mutual Assistance (TEMA) supporting these activities.

3 Dr. Gunnar Kullenberg, Secretary IOC, thanked the Government of Mexico for hosting the Meeting and described the relevance of on-going and planned IOCARIBE programmes as well as services in the global context. He emphasized on the importance of IOC/IOCARIBE activities now evolving from scientific supporting programmes to operational ones of relevance to different users and decision-makers at the global/regional/national levels. This must be strengthened due to heavy commitments assigned to IOC by UNCED '92. To accomplish these tasks the Commission must develop at all levels a strategy of alliances or partnership with similar agencies of the UN System and others. However, the latter will not be possible if Member States at the agencies do not coincide with these priorities. This is the only way to develop a viable IOC.

4 The opening statement by the Secretary of IOC, is appended as Annex IV.

5 Dr. Manuel M. Murillo, Chairman of IOC, summarized main outputs of UNCED '92 impacting IOC/IOCARIBE programmes and strongly emphasized the TEMA involvement in attaining expected results. He also insisted in the need of increased involvement of Member States of the region to accomplish these tasks.

6 Dr. Hernan Perez-Nieto, Chairman of IOCARIBE, welcomed the participants and further elaborated on main elements of the IOCARIBE Medium-Term Plan to be reviewed during the present Session.

7 Lic. Avelino Muñoz-García, officially declared open the Fourth Session of the IOCARIBE Sub-Commission on behalf of the Governor of Veracruz and the Government of Mexico.

8 The List of Participants is attached as Annex III.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

9 The Provisional Agenda (Document SC-IOCARIBE-IV/1 prov.) was presented to the Sub-Commission for approval. Since agenda items 7 and 8 were very closely related, it was recommended that both items be combined into one. This was unanimously approved by the Sub-Commission.

10 The Agenda, as adopted, is enclosed in Annex I.

2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION

11 The Chairman suggested that, after consultations with the English-speaking delegations, a single bilingual Rapporteur be designated. The Mexican Delegation proposed as Rapporteur Dr. Gerardo Gold-Bouchot. This proposal was accepted unanimously by the Sub-Commission.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

12 The IOC Senior Assistant Secretary for IOCARIBE and Technical Secretary for the Session, Dr. Fernando Robles, briefly described the administrative arrangements and presented a Provisional Timetable (SC-IOCARIBE-IV/1 prov. add) for the Session.

13 Due to problems with available infrastructure at the IOCARIBE Secretariat, the Report on Intersessional Activities (Document SC-IOCARIBE-IV/6) had to be prepared only in English.

14 Venezuela requested the Secretariat that the Report of the Second Meeting of IOCARIBE Officers should be reproduced and distributed to Delegations, and included in the List of Documents (Document SC-IOCARIBE-IV/4 prov. rev. 1) reviewed by the Technical Secretary.

15 Several social and cultural activities prepared by the host country, Mexico, were announced and thankfully acknowledged.

3. INTERSESSIONAL ACTIVITIES

16 The IOC Senior Assistant Secretary for IOCARIBE reviewed activities undertaken since the last Session of the Sub-Commission (Caracas, Venezuela, 4-8 December 1989), described in Document SC-IOCARIBE-IV/6. He emphasized on the efforts made by the Secretariat as well as the networks of institutions concerned with the implementation of the Medium-Term Plan elements, developed in Caracas into an operational phase.

17 The absence in the present Session of many the Member States is worrisome. The Secretary of IOC, Dr. Gunnar Kullenberg analyzed the situation in the context of the large number of international meetings taking place at the same time, as a result of UNCED, as well as the limited resources available for Member States to cover all these demands.

18 Venezuela considered that TEMA has not received enough coverage, and requested the Technical Secretary to modify the Intersessional Report accordingly.

4. OCEAN SCIENCES

4.1 OCEAN PROCESSES AND CLIMATE

19 The Chairman of the IOCARIBE Group of Experts on Ocean Processes and Climate, and Vice-Chairman of IOCARIBE, Dr. George Maul, presented this topic referring to the First Meeting of the IOCARIBE Group of Experts on OPC (Document IOCARIBE/GE-OPC-I/3). It was emphasized that the Group of Experts recommends numerical forecasting models as the central activity in OPC.

20 The Sub-Commission commended the report, and requested the OPC Group of Experts to identify activities relevant to GOOS that can be done in the IOCARIBE Region, and how GOOS will benefit the Member States.

Small Island Oceanography

21 Dr. Maul asked the plenary for comments on the proposed terms of reference for the Workshop on Small Island Oceanography, which had been circulated as Document SC-IOCARIBE-IV/Inf. 2 (See Annex V for revised version). It was suggested that the title and objectives be changed to reflect the interest on the role of oceanography on the sustainable development of small islands. This clearly links this activity to UNCED. The Secretary of IOC confirmed that the Workshop will be partially supported through IOC, and that it will be added to the 1992 - 1993 workplan submitted to SAREC. The French Delegation kindly offered to host this gathering in either Martinique or Guadeloupe. The Sub-Commission gratefully accepted the offer. The Caribbean Environmental Programme of UNEP agreed to co-sponsor the Workshop.

22 The Member States unanimously and fully endorsed the Workshop.

23 The Sub-Commission adopted Recommendation SC-IOCARIBE-IV.1.

4.2 MARINE POLLUTION RESEARCH, MONITORING AND ABATEMENT-REGIONAL COMPONENT OF GIPME/MARPOL/MON - JOINT IOC-UNEP CEPPOL PROGRAMME

- 24 This Agenda Item was introduced by Mr. Anders Alm, IOC Consultant for IOCARIBE, referring to recent developments of the CEPPOL Programme, and in particular, to activities on pollution by Oil and Marine Debris, Pesticides, and Eutrophication. During the last 3 years these activities have increased significantly. The experience and institutional network of the CARIPOL Programme have been incorporated in the CEPPOL Programme.
- 25 The IOCARIBE Programme on Marine Pollution Research and Monitoring provides a clear and direct input to the activities proposed in Agenda 21, Chapter 17 and the Convention on Biodiversity developed during UNCED 1992.
- 26 The IOC and IOCARIBE Secretariats have made efforts to raise additional funding for the CEPPOL Programme and contributions from SAREC of Sweden and NOAA, EPA, Coast Guard and International Sea Grant of US have been received. These contributions have been used to support projects within the pesticide and eutrophication components of CEPPOL, the musselwatch programme and specific activities related to marine debris. An agreement on technical co-operation between the IOC and the Association of State Oil Corporations in Latin America and the Caribbean (ARPEL) on protection of the marine environment was signed in Cartagena, July 1991, and co-operative efforts are being discussed. With the support from SIDA of Sweden, two Minor Field Studies have been carried out.
- 27 The Sub-Commission expressed its satisfaction in the way the co-operation between IOC/IOCARIBE and UNEP/CEP has developed with reference to the CEPPOL Programme. Regarding the co-ordination of the CEPPOL Programme, the Sub-Commission recommended that the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring should continue to operate as a scientific/technical advisory body to assist the CEPPOL Programme, the Musselwatch Programme as well as other related activities. The IOCARIBE Group of Experts will provide necessary scientific input to a Joint IOC/UNEP CEPPOL Group of Experts.
- 28 The Representative of UNEP and RCU/CEP pointed out that these two groups have different procedures and terms of reference and since the IOC/UNEP Joint Group of Experts for CEPPOL needs the scientific technical input from the IOCARIBE Group of Experts, both groups should be kept and strengthened.
- 29 The Sub-Commission expressed its concern that the CEPPOL Co-ordinator position remains vacant, and requested the Secretary of IOC to fund and fill this post as soon as possible.
- 30 The Secretary of IOC explained the financial and administrative constraints affecting the fulfillment of the post of the CEPPOL Co-ordinator. Funds for this post are available (roughly 25% from IOC), and it is expected to have the position filled during early 1993. The US Delegation requested that the selection be made by the IOC. The Secretary of IOC explained that the decision is taken jointly by IOC, UNEP and IAEA. One of the requirements is familiarity with IOCARIBE and UNEP activities in the region.
- 31 The Secretary of IOC said that the activities carried out in the Caribbean within the CEPPOL Programme, should provide a solid basis for a proposal to be presented to the Global Environmental Facility of the World Bank; however, such a proposal must go through the governments concerned. He suggested that this proposal be included in the Summary Report, so that the Secretariat has a legal basis to pursue the matter.
- 32 The Representative of UNEP and RCU/CEP expressed that the Caribbean is not receiving a fair share of GEF funds, and that the IOC/UNEP Joint CEPPOL Programme could be a good opportunity to accede to such funds, since it is a regional effort.
- 33 The Sub-Commission endorsed this proposal and requested the IOC and UNEP Secretariats to initiate contacts with GEF in order to present a formal proposal.

- 34 **The Sub-Commission expressed its gratitude to the Governments of Sweden and the USA for their support for the IOCARIBE Marine Pollution Research and Monitoring Programme.**

4.2.1 Oil Pollution

- 35 The CEPPOL Activity IV Pollution by Petroleum Hydrocarbons has advanced according to the workplan. Based on recommendations from the CEPPOL Workshop on Monitoring and Control of Pollution by Oil and Marine Debris, Cartagena, Colombia, 22-24 July 1991, 3 project proposals related to the development of a fingerprint data bank of crudes and derivatives transported throughout the region and on biological effects in chronical polluted areas were supported. The final reports are under preparation.
- 36 An agreement on Technical Co-operation between IOC and the Association of State Oil Corporations in Latin American and the Caribbean (ARPEL) was signed in July 1991 and some joint pilot activities are underway.
- 37 The IOC-UNEP-ARPEL-IMO CEPPOL Oil and Marine Debris Evaluation Meeting, Merida, Mexico, 19-21 August 1992 reviewed the implementation of the CEPPOL Oil Component. It was noted that this component is changing from being just a monitoring programme towards an activity with clear management relationship. Fingerprinting of oil, biological impacts and provision of oceanographic circulation data for the development of oil spill contingency planning are among the recent activities. The work carried out through the Programme on Ocean Processes and Climate is playing an important role in this sense.
- 38 **The Sub-Commission expressed its concern with the decrease in data reporting to the CARIPOL data bank and requested the reasons for this should be identified.**
- 39 **The Sub-Commission adopted the reports from the IOC/UNEP (CEPPOL) Workshop on Monitoring and Control of Pollution by Oil and Marine Debris in the Caribbean, and from the IOC/UNEP/ARPEL/IMO CEPPOL Oil and Marine Debris Evaluation Meeting and recommended the Secretariats of IOC/IOCARIBE and UNEP to further develop this programme and strengthen the collaboration with relevant organizations, in particular ARPEL and IMO.**

4.2.2 Marine Debris

- 40 Mr. Stefan Andersson, IOC Associate Expert for IOCARIBE, introduced this Agenda Item.
- 41 The expansion for marine debris from being a purely monitoring activity into a component where scientists, managers and decision-makers are participating was highlighted.
- 42 The outcome from the IOC-UNEP (CEPPOL) Workshop on Monitoring and Control of Pollution by Oil and Marine Debris, Cartagena, Colombia, 22-24 July, 1991 was presented. The results from the Marine Debris Pilot Monitoring Project, initiated within the CARIPOL Programme, co-ordinated by the University of Puerto Rico, and with participation of CIOH, Colombia and CINVESTAV, Mexico, as well as the Document on the State of Pollution by Oil and Marine Debris were presented. As a request of one of the recommendations from the Workshop, the marine debris monitoring activities have been extended to include St. Lucia, Cuba, Barbados and Cayman Islands.
- 43 It was stressed that a main outcome is the formulation of the Marine Debris Action Plan, as a result of the IOC-UNEP (CEPPOL) Second Marine Debris Workshop, Merida, Mexico, 17-19 August 1992. The excellent support by the host institution, CINVESTAV, the efforts of the Steering Committee, together with the high participation of representatives from the scientific community, environmental authorities, NGOs, shipping industry, cruise lines, oil industry and international organizations such as the World Bank, IMO and IOC, made this Workshop very successful.
- 44 It was further stated that the Marine Debris Action Plan for the Caribbean has already obtained funding for two out of eleven action items, and has a very good funding potential for another two items. The

result has also been brought to the attention of the US Senate during a public hearing on MARPOL 73/78 Annex V.

45 The linkage between UNCED's Agenda 21 (Chapter 17), as well as the Convention on Biodiversity and the action items of the Marine Debris Action Plan was highlighted.

46 Cuba offered to host the Third Marine Debris Workshop, eventually in conjunction with the Third Conference on Marine Sciences, scheduled for February 1994.

47 **The Sub-Commission thanked Cuba for this offer.**

48 **The Sub-Commission commended the result from the Second Marine Debris Workshop and recommended Member States to fully support and to distribute the Marine Debris Action Plan for the Caribbean to relevant institutional authorities for immediate implementation.**

4.2.3 Eutrophication

49 A new component on the significance of increased turbidity and eutrophication in the Wider Caribbean as a result of changing land-based activities has been incorporated in the CEPPOL Programme.

50 It was stressed that thanks to the support from SAREC, IOCARIBE has been able to initiate a project on Nitrogen Transformation in Tropical Lagoons as the first activity in the field of eutrophication.

51 **The Sub-Commission noted that the eutrophication component of the CEPPOL programme is an important contribution to the Agenda 21, of UNCED, especially its Chapter 17.**

4.2.4 Minor Field Studies

52 The on-going IOCARIBE-SIDA programme on Minor Field Studies was explained. Two such studies have been carried out: a) impact of shrimp farming on mangrove ecosystems, and b) the use of metallothionein as indicator of heavy metal pollution (both in Cartagena Bay, Colombia). The future potential for this exchange between young scientists from Sweden and of the region as part of TEMA was highlighted.

53 **The Sub-Commission adopted Recommendation SC-IOCARIBE-IV.2.**

4.3 REGIONAL COMPONENT OF THE IOC-UN (OALOS) PROGRAMME ON OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

54 Dr. Georges Vernet, IOC Consultant for IOCARIBE presented this Agenda Item, giving special emphasis to the project proposal on "Climate Change and Coastal Land Loss: Management and Decision Making in support of a Sustainable Development within the Caribbean and Adjacent Regions". Dr. Vernet emphasized that this project fits perfectly under Agenda 21, Item A, Chapter 17 of UNCED concerning management of coastal zone and also under specific objectives listed in the same Document such as those related to coastal evolution and training programmes in coastal oceanography. A recent step in the development of this project was the Expert Consultation Meeting convened in Cartagena 10-12 August 1992, where a Workshop was proposed to take place at the Institute of Marine Affairs, Trinidad & Tobago, during the second trimester of 1993. He also mentioned that discussions are being held with the French Committee for IOC seeking possibilities to support a Training Course in the French Antilles. The relationship between the OPC and the OSNLR programmes was underlined. Dr. Vernet stressed that in order to obtain funding from the African-Caribbean-Pacific (ACP) Group of the CEC, it is essential that Member States manifest their support for the implementation of the project, not only at the scientific level but also at the administrative and political levels.

55 Several delegations expressed their support to the project proposal noting that within the IOCARIBE framework this project is of major importance and therefore requested the Secretariat to further the co-ordination at the regional level.

56 The Delegation of Venezuela stated that its country has two geographic scenarios that can be incorporated within the project.

57 The Delegation of Panama suggested to prioritize the training component of the project.

58 The French Delegation expressed its support to the project, with special emphasis on items related to research and monitoring of the coastal zone which is being developed at the French Antilles.

59 The Secretary of IOC summarized on the support obtained from the delegations and proposed that the IOCARIBE Secretariat should send a draft letter of support for the project to Member States to be transmitted to the ACP Secretariat at the CEC in Brussels.

60 The Sub-Commission expressed its gratitude to the Government of Canada for the support provided to develop this proposal.

61 The Sub-Commission adopted Recommendations SC-IOCARIBE-IV.3 and SC-IOCARIBE-IV.4.

4.4 REGIONAL COMPONENT OF THE IOC-FAO PROGRAMME ON OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

62 Dr. Alejandro Yañez-Arancibia, Chairman of the IOCARIBE/TRODERP Group of Experts presented the OSLR/IREP topic, giving special emphasis to the TRODERP regional initiative. His presentation included the definition of TRODERP within OSLR/IREP and the evolution it has undergone from 1984 (First Session of the GGE/OSLR, Paris, July 1984). Likewise, he highlighted the TRODERP theoretical and conceptual framework and the progress made during the TRODERP workshops and meetings held in Ciudad del Carmen, Mexico (April 1986); Cartagena, Colombia (May 1987); and Caracas, Venezuela (September 1989).

63 The main results presented relates to the Summary Report of the Workshop to define IOCARIBE/TRODERP Proposals held in the University Simon Bolivar, Caracas 12-16 September 1989 (Document IOCARIBE/WSH-TRODERP-I/3). In this regard, the definition, objectives and aims of the SOAR, FEDERP, PREP and CORDERP sub-projects were thoroughly reviewed as well as goals achieved and bilateral activities performed.

64 An analysis of the TEMA component and its relationship with some training courses dealing with ecosystems and recruitment in the framework of TRODERP and the EPOMEX Programme was presented in his report. The need to organize new training courses on recruitment of tropical demersal species, especially taking into account progress made in conceptual and methodological aspects in the Gulf of Mexico was indicated in this context.

65 The Sub-Commission noted with satisfaction the potential development of the TRODERP regional initiatives and expressed its appreciation to Dr. Yañez-Arancibia for the co-ordination effected and leadership provided.

66 The Sub-Commission considered that this programme has a high priority for the region. It requested the Secretariat to undertake contacts with the Member States so that the national technical committees proposed for TRODERP become active.

67 The Sub-Commission re-endorsed in principle the sub-projects on SOAR, FEDERP, PREP and CORDERP and instructed the IOCARIBE Secretariat to take the necessary steps to secure their implementation.

68 The Sub-Commission noted that not enough attention has been given to the programme on Harmful Algal Blooms and Ciguatera. The Chairman informed that a Workshop on this subject co-sponsored by IOC/IOCARIBE was organized by Venezuela in Cumaná, 16-19 September 1992. A network of laboratories was created and a series of short technical courses were identified.

69 **The Sub-Commission recommended** that the activities of the programme IOCARIBE/OSLR be linked to the users, in a similar way that is being done in marine pollution.

70 On the overall context of regional OSLR, the US Delegation offered to organize and host during the 93/94 biennium, an IOCARIBE Workshop on Relationship of Oceanography to the Ecology and Fisheries for Highly Migratory and associated Stradling Species, to be held at the NOAA/NMFS Southeast Fisheries Science Center, Miami, Florida, USA. The organizers will cover organization and publication costs and partially fund travel for participants from less-developed countries. This responds to the concern for these resources expressed by UNCED Agenda 21, Chapter 17.

71 **The Sub-Commission noted** with satisfaction this offer and **endorsed** the proposal of the US Delegation.

72 **The Sub-Commission approved Recommendation SC-IOCARIBE-IV.5.**

4.5 **INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA AND THE GULF OF MEXICO (IBCCA)**

73 Dr. Nestor Duch-Gary, Director General de Geografia del Instituto Nacional de Estadística, Geografía e Informática, and Chairman and Chief Editor of the Editorial Board for IBCCA, introduced this Agenda Item referring to the Report of the Fourth Meeting of the Editorial Board, Havana, Cuba, 24-26 March 1992 (Document IOC/EB-IBCCA-IV/3).

74 Main outputs of the IBCCA project are: publication of the first IBCCA sheet assigned to Mexico (which was distributed to the plenary); the establishment of a primary source databank with digital information in Mexico; and the future creation of an IBCCA data center in Cuba.

75 The Chief Editor brought the attention of the Sub-Commission to Annex VII of the Report, listing the Chronogram of delivery and publication of the IBCCA Sheets among participating Member States, emphasizing the need to meet the delivery dates agreed upon. He also urged countries concerned, to proceed with efforts so as to digitalize as much as possible the IBCCA basic information. Finally, he requested advice from Costa Rica to define in the near future, the place and dates for the Fifth Meeting of the Editorial Board, since United States has made an alternative offer.

76 Many delegates commended the work accomplished through the IBCCA Project as an example of useful regional co-operation aimed at serving different scientific and practical purposes.

77 **The Sub-Commission took note** with satisfaction of the progress made by the IBCCA Project and urged Member States to fulfill the Recommendations and tasks summarized by the Chief Editor.

5. **OCEAN SERVICES**

5.1 **REGIONAL COMPONENT OF THE GLOBAL SEA-LEVEL OBSERVING SYSTEM (GLOSS)**

78 This Agenda Item was introduced by Dr. Maul, GLOSS Co-ordinator for the IOCARIBE Region. He discussed GLOSS development referring to Document SC-IOCARIBE-IV/Inf. 7. The importance of long-term records of mean sea-level was stressed, specially for shipping, safety at sea and fisheries.

79 The number, location and operational status of the network of tide-gauges in the region were reviewed. This is one of the most successful IOCARIBE programmes, due to the commitment of Member States and institutions, and co-operation amongst participants. GLOSS, the global sea-level observing network, has therefore a regional component that is very active in improving coverage of tide-gauges, including updating from analog to digital equipment. Gauges have been established or re-established at Cumaná, South Caicos, Costa Rica, Guantanamo Bay, Aruba, Tobago, Barbados and Puerto Morelos since SC-IOCARIBE-III. Gauges at

Jamaica, Florida (USA) and Haiti are known to have been destroyed. It is anticipated that new gauges at Kingston (Jamaica), Georgetown (Guyana), Punta Maisi (Cuba) Cap du Mole (Haiti) and Isla de Aves and Isla Orchila (Venezuela) will be operational before SC-IOCARIBE-V.

80 In order to improve the use of the regional GLOSS, a new programme of monthly sea-level anomaly charts will be created and disseminated by Costa Rica. Participating countries are encouraged to provide Mr. Alejandro Gutierrez, SERMAR-UNA, Apartado 7-3310, San Jose 1000 Costa Rica, the mean sea-level at their tide-gauges within one week of the end of the month. The monthly anomalies will be reviewed for accuracy, and the regional anomalies contoured in a fashion similar to the TOGA Pacific Sea-Level Project. This IOCARIBE Sea-Level product will focus GLOSS efforts, and offer the opportunity to directly apply oceanography to societal needs.

81 For the future, the primary need will be to replace aging gauges with satellite telemetering digital acoustic (non contact) instruments. The inherent self-calibrating nature of acoustic tide gauges will greatly improve sea-level measurements for long-term climate change analysis, and the telemetry capability will provide real-time data for nowcasting geostrophic currents and for data assimilation into numerical ocean circulation models.

82 Mexico stressed the need to co-operate with specialists from other disciplines to relate changes in mean sea-level to sedimentary, tectonic and anthropogenic changes.

83 Venezuela announced the establishment of tide-gauges in two islands during 1993. Islands are more isolated from anthropogenic influences, and are thus better observational places.

84 The Sub-Commission strongly encouraged Member States to participate in GLOSS, to assist neighbouring countries in this sea-level programme and to place the highest priority on sea-level observations for scientific and socio-economic application.

5.2 REGIONAL COMPONENTS OF THE IOC-WMO-ICSU GLOBAL OCEAN OBSERVING SYSTEM (GOOS)

85 Dr. Maul also introduced this Agenda Item.

86 The development of GOOS goes back a couple of years, during discussions of the Global Climate Observing System (GCOS). The importance of the oceans as modulators of global climate was recognized, and thus the importance of a Global Ocean Observing System. GOOS is part of GCOS, but for the oceans, has elements that address oceanic needs on all time and space scales. GOOS includes surface observations from ships and satellites, sub-surface observations from buoys, ships, and aircraft, numerical modelling and data assimilation, data archiving, and provision of products to interested parties. It also includes elements for coastal zone management, fisheries, research and education.

87 GOOS will be the central programme of the IOC into the next century, and it is incumbent on all Member States particularly IOCARIBE Member States to become involved.

88 GOOS was strongly endorsed at UNCED, in co-operation with WMO and UNEP.

89 The Secretariat called the attention to relevant work of the IOCARIBE-OPC Group of Experts, which has already begun planning GOOS activities, as stated in the corresponding report.

90 Member States were encouraged by the Sub-Commission to participate in GOOS, and indeed in many of the international activities such as the IPCC, by making their interest known. In addition, GOOS focal points should be appointed in each country and this identity made known to the IOC.

- 91 Venezuela has nominated two oceanographers to a GOOS Regional Committee. It also has formed a National GOOS Committee.
- 92 **The Sub-Commission adopted Recommendation SC-IOCARIBE-IV.6.**
- 5.3 **DEVELOPMENT OF THE INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE (IODE) SYSTEM TO MEET REGIONAL NEEDS**
- 93 The IOCARIBE Senior Assistant Secretary introduced this Agenda Item referring to content and recommendations of two IOC Training Courses organized in the region to improve IODE capabilities.
- 94 The first one was the IOC Training Course on the Application of Satellite Remote Sensing to Marine Studies, Caracas, Venezuela, September 1990 (IOC Training Course Report No. 16). The course was attended by 24 trainees and instructors from Venezuela, Costa Rica, Barbados, Colombia, Mexico, Trinidad and Tobago, Germany, UK and USA. The main topics included: evaluation of remote-sensing systems; fundamentals of RS-Visible/IR; analysis techniques; application of ocean colour; application of sea-surface temperature; SST data; ocean colour data; introduction to microwave, synthetic aperture radar and theory for scatterometry; surface features imaged by SAR; application of SAR and airborne measurement; the radar altimeter and the measurement of surface topography; measurement of waves and winds; ocean circulation and regional studies and programmes.
- 95 Main recommendations of the course was to initiate a feasibility study on the creation of a network of satellite data archives using facilities that already exist or that could be enhanced at modest cost.
- 96 The second one was an IOC Training Course on Microcomputers and Management of Marine Data in Oceanographic Data Centres of Spanish Speaking Countries in the Caribbean Region, Bogota, Colombia, October 1991, which was attended by 15 experts from 5 Member States and covered by instructors from the Netherlands and Argentina. The course developed a wide variety of topics related to NODCs, including intensive practical training with microcomputers. Main recommendations listed needs for progressively developing a regional network of NODCs; formation in the future of a supporting Group of Experts; incorporation of archives containing remote sensing information; individual training and, development of e-mail networking. Regarding the latter, the Technical Secretary reports on a preliminary effort to establish communication via e-mail (Omnet) between the IOCARIBE Secretariat, Officers and Chairmen of IOCARIBE Groups of Experts, supported through a 3-year donation from the USA (Documnet SC-IOCARIBE-IV/Inf. 9).
- 97 **The Sub-Commission commended the training efforts made by the Secretariat during the intersessional period regarding these important aspects of the IOCARIBE services development and urged Member States to follow-up at national levels the recommendations made during these high standard training courses.**
- 98 **The Sub-Commission thanked the USA for its preliminary support to establish an operational e-mail networking between the Secretariat, Officers and Experts.**
6. **TRAINING EDUCATION AND MUTUAL ASSISTANCE (TEMA) IN SUPPORT OF THE SUB-COMMISSION PROGRAMMES AND SERVICES**
- 99 The Chairman of IOCARIBE introduced this Agenda Item, presenting a position document on IOCARIBE TEMA Strategy and Development (Documnet SC-IOCARIBE-IV/Inf. 10).
- 100 TEMA must be a very important and integral part of all research and services efforts. In this context, it is very important that the Secretariat undertakes efforts to promote, on pilot basis, the establishment of recommended Marine Science Country Profiles. The need to establish, and strengthen, as appropriate, regional networks of marine science research and academic institutions, was recalled. An inventory of existing programmes regionally co-ordinated should also be undertaken by the Secretariat, so that on these experiences further TEMA work can be built.

101 The UNEP Representative mentioned that this efforts could benefit from the experience of the
Caribbean Consortium of Universities where development of Marine Science related modules has been done.

102 It was also mentioned past experiences on joint research cruises. Experiences as such should continue
and be expanded to on-board training, including technicians.

103 The Sub-Commission adopted Recommendation SC-IOCARIBE-IV.7.

7. REGIONAL ACTION PLAN FOR THE FOLLOW-UP TO UNCED AND RELATED ACTION PLAN
FOR 1994 - 1995 (FURTHER IMPLEMENTATION OF THE IOCARIBE MEDIUM TERM PLAN)

104 The IOCARIBE Secretariat introduced this Agenda Item. The current Medium-Term Plan was briefly
reviewed as well as suggestions derived from the preceding Seminar on UNCED results.

105 The Delegate from Costa Rica and Chairman of IOC called for a rationalization of the Medium-Term
Plan, in terms of priorities, realistic budget approach and TEMA needs. He recommended to develop a new
updated plan. Since this would be impossible to be done during the present Session, it was suggested that the
3 Vice-Chairmen and the Chairman, in close consultation with the Secretariat should develop a revised version
of the plan before to be submitted to Member States and the IOC-XVII Assembly at the end of February 1993.

106 The Sub-Commission approved this course of action.

107 The Secretariat introduced the Document Draft Proposal for the Development of a Strategy to
establish a Funding Mechanism for the Implementation of the IOCARIBE Medium Term Plan (Document SC-
IOCARIBE-IV/7).

108 In spite of the preliminary nature of this Document and the need to be further elaborated, the Sub-Commission
unanimously agreed with the basic need to establish a funding procedure based upon contributions of Member
States to the Sub-Commission.

109 The Sub-Commission instructed the Secretariat to further develop this mechanism in consultation with
the IOCARIBE Officers, Member States and the IOC Secretary.

110 Regarding overall Secretariat implementation and future anticipated staffing problems in the
IOCARIBE Secretariat, the Sub-Commission approved Recommendation SC-IOCARIBE-IV.8.

8. CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES.

111 Mr. Alm gave a general introduction to this Agenda Item highlighting in particular the co-operation
with UNEP, IMO, IAEA and ARPEL.

8.1 UNEP REGIONAL SEAS ACTION PLAN FOR THE CARIBBEAN ENVIRONMENT
PROGRAMME (CEP)

112 Ms. Beverly Miller from UNEP introduced this Agenda Item.

113 The various regional programmes of the RCU of UNEP were described in general terms: SPAW,
CEPPOL, CEPNET and IPID.

114 The Rio Conference (UNCED) recommended among other things, that UN Agencies co-operate, and
work together at the regional level. This kind of interagency co-operation has begun its successful implementation
in the Caribbean through joint efforts of IOC/IOCARIBE and UNEP/RCU. The joint IOCARIBE/RCU
CEPPOL programme and the joint UNEP/IOC Task Team on Climate Change are clear examples.

8.2 CO-OPERATION WITH ASSOCIATION OF THE STATE OIL CORPORATIONS OF LATIN AMERICA AND THE CARIBBEAN (ARPEL)

115 The Secretariat briefly described the work which led to the Agreement between IOC and ARPEL on Technical Co-operation to Protect the Marine Environment referring to Document SC-IOCARIBE-IV/Inf. 12, and to the contacts underway to carry out pilot activities.

116 The Sub-Commission commended the co-operative efforts with ARPEL and recommended the Secretariat to explore the possibilities to expand the co-operation with the oil industry to other areas where the oil industry and IOCARIBE have common interests such as research on mangroves, offshore resources, bottom sediments, etc.

8.3 CO-OPERATION WITH THE INTERNATIONAL MARITIME ORGANIZATION (IMO)

117 Mr. Andersson reviewed the co-operation with IMO at the regional level in particular the working relationship and contacts established with the IMO Regional Consultant based in Puerto Rico (Document SC-IOCARIBE-IV/Inf. 13).

118 He noted that the co-operation between IOCARIBE and IMO has been strengthened during the last years to the benefit of the region. Mr. Andersson expressed that as the CEPOL Oil and Marine Debris components are becoming more extensive, an integrated approach, together with IMO, is becoming necessary, in order to combat the pollution problem in many areas.

119 The IMO Regional Consultant participated in the IOC-UNEP (CEPOL) Workshop on Monitoring and Control of Pollution by Oil and Marine Debris, Cartagena, 22-24 July 1991. Several action items on marine debris and oil pollution were jointly elaborated. The IMO Regional Consultant also contributed to make the IOC-UNEP (CEPOL) Second Marine Debris Workshop, Merida, Mexico, 17-19 August 1992, as well as the IOC-UNEP (CEPOL) Oil Pollution and Marine Debris Evaluation Meeting, Merida, Mexico, 19-21 August 1992 very successful events.

120 It was stressed that many of the Action Items in the Marine Debris Action Plan have jointly been elaborated and in order to implement the items, joint efforts are needed.

121 The UNEP Representative stressed that UNEP is actively working together with IMO in matters related to Port Reception Facilities, and that it is important to continue with the monitoring work in order to make effective the special area designation under Annex V of MARPOL 73/78.

122 The Mexican Delegation stressed that Mexico ratified MARPOL 73/78 on 29 July 1992. The Delegate stated that, even though having financial difficulties, Mexico is implementing the regulations regarding equipment, training, inspection and certification.

123 The Sub-Commission urged Member States to become signatories of the MARPOL Treaty.

8.4 OTHER REGIONAL PROGRAMMES

124 The Delegate from Panama notified that in the beginning of January 1993, Panama will host the "Centro de Investigaciones para el Tropico Humedo de America Latina". One of its programmes is the interaction at the ocean - atmosphere - land interface. The Government of Panama invited IOCARIBE to establish joint projects.

9. ELECTION OF OFFICERS

125 **The Sub-Commission re-elected the Chairman Dr. Hernan Perez-Nieto by acclamation.**

126 **The Sub-Commission decided to create a third position as Vice-Chairman. It was agreed that the number of Vice-Chairmen should not exceed three in the future. It was also decided that the Sub-Commission should not necessarily fill all three Vice-Chairmen positions if the case arises in the future.**

127 **The Sub-Commission re-elected the two present Vice-Chairmen Dr. G. Maul, USA, and Lic. Guillermo Garcia-Montero, Cuba. Lic. Arturo Salcido-Beltran from Mexico was elected as a new Vice-Chairman of the IOCARIBE Sub-Commission. At a separate meeting of the new officers, the following primary assignments were made; Dr. H. Perez-Nieto: OSNLR, Medium-Term Plan, Coastal Management; Dr. G. Maul: OPC, GLOSS and GOOS; Lic. G. Garcia-Montero: CEPOL, OSLR and IODE; Lic. A. Salcido-Beltran: TEMA, IBCCA and IOCARIBE development. The officers requested that interested parties in these activities contact the appropriate officer.**

10. DATES AND PLACE OF THE FIFTH SESSION OF THE SUB-COMMISSION

128 **The Delegate of Costa Rica offered his country to host the Fifth Session of the Sub-Commission.**

129 **The Sub-Commission acknowledged this offer with appreciation and accepted it.**

130 **Regarding the dates, after considering a number of comments and alternatives, the Sub-Commission recommended in principle the end of 1994 so as to precede the Eighteenth Session of the IOC Assembly in 1995.**

131 **The Sub-Commission recommended to organize and document more carefully the *ad hoc* IOCARIBE Meetings done in conjunction with the Sessions of the Governing Bodies of IOC, as well as to plan for IOCARIBE review officers meetings during the intersessional period.**

11. ADOPTION OF THE DRAFT SUMMARY REPORT AND RECOMMENDATIONS

132 **The Sub-Commission adopted the Summary Report and Recommendations from the Fourth Session, as reviewed during this Agenda Item.**

12. CLOSURE

133 **The Chairman, on behalf of the delegations, thanked the local organizing committee of Mexico, headed by Lic. A. Salcido-Beltran, for the excellent facilities and support provided for this meeting as well as for the preceding Seminar on "Rio '92 - Strategy and Action Plan of IOC - Projections for IOCARIBE".**

134 **The Session was closed 12.30, Monday 7 December 1992.**

ANNEX I

AGENDA

- 1. OPENING**
- 2. ADMINISTRATIVE ARRANGEMENTS**
 - 2.1 ADOPTION OF THE AGENDA**
 - 2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION**
 - 2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION**
- 3. INTERSESSIONAL ACTIVITIES**
- 4. OCEAN SCIENCES**
 - 4.1 OCEAN PROCESSES AND CLIMATE**
 - 4.2 MARINE POLLUTION RESEARCH, MONITORING AND ABATEMENT - REGIONAL COMPONENT OF GIPME-MARPOLMON - JOINT IOC/UNEP CEPPOL PROGRAMME**
 - 4.2.1 Oil Pollution**
 - 4.2.2 Marine Debris**
 - 4.2.3 Eutrophication**
 - 4.2.4 Minor Field Studies**
 - 4.3 REGIONAL COMPONENT OF THE IOC-UN (OALOS) PROGRAMME ON OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)**
 - 4.4 REGIONAL COMPONENT OF THE IOC-FAO PROGRAMME ON OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)**
 - 4.5 INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA AND THE GULF OF MEXICO (IBCCA)**
- 5. OCEAN SERVICES**
 - 5.1 REGIONAL COMPONENT OF THE GLOBAL SEA-LEVEL OBSERVING SYSTEM (GLOSS)**
 - 5.2 REGIONAL COMPONENTS OF THE IOC-WMO-ICSU GLOBAL OCEAN OBSERVING SYSTEM (GOOS)**
 - 5.3 DEVELOPMENT OF THE INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE) SYSTEM TO MEET REGIONAL NEEDS**
- 6. TRAINING EDUCATION AND MUTUAL ASSISTANCE (TEMA) IN SUPPORT OF THE SUB-COMMISSION PROGRAMMES AND SERVICES**
- 7. REGIONAL ACTION PLAN FOR THE FOLLOW-UP TO UNCED AND RELATED ACTION PLAN FOR 1994 - 1995 (FURTHER IMPLEMENTATION OF THE IOCARIBE MEDIUM-TERM PLAN)**

8. CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES
 - 8.1 UNEP REGIONAL SEAS ACTION PLAN FOR THE CARIBBEAN ENVIRONMENT PROGRAMME (CEP)
 - 8.2 CO-OPERATION WITH ASSOCIATION OF THE STATE OIL CORPORATIONS OF LATIN AMERICA AND THE CARIBBEAN (ARPEL)
 - 8.3 CO-OPERATION WITH THE INTERNATIONAL MARITIME ORGANIZATION (IMO)
 - 8.4 OTHER REGIONAL PROGRAMMES
9. ELECTION OF OFFICERS
10. DATES AND PLACE OF THE FIFTH SESSION OF THE SUB-COMMISSION
11. ADOPTION OF THE DRAFT SUMMARY REPORT AND RECOMMENDATIONS
12. CLOSURE

ANNEX II

RECOMMENDATIONS

Recommendation SC-IOCARIBE-IV.1

WORKSHOP ON SMALL ISLAND OCEANOGRAPHY

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

Noting the need expressed in UNCED Agenda 21, Chapter 17 and the United Nations General Assembly resolution recalling for a "Global Conference on Sustainable Economic Development in Small Island States" in April 1994,

Noting further the progress of the Joint IOC-UNEP Task Team on Implications of Climate Change in the Wider Caribbean in developing a PC-based numerical model as a socio-economic decision support system for small islands, and

Supporting the deliberations of the IOCARIBE Group of Experts on Ocean Processes and Climate, and

Considering the responsibility of IOC and UNEP to provide technical assistance in oceanography and environmental management,

Recommends that IOCARIBE convene a "Workshop on Small Island Oceanography in relation to Sustainable Economic Development and related Coastal Area Management" in the French Antilles in November 1993 for approximately 25 (primarily) invited participants;

Requests that IOC and UNEP provide financial and secretariat support, in particular obtaining funding for the organizing committee's expenses and for publications; and

Further requests that the outcome of this Workshop be communicated to the UN/GA global conference, by supporting the attendance of participants selected during the Workshop at the global conference.

Recommendation SC-IOCARIBE-IV.2

MARINE POLLUTION RESEARCH AND MONITORING

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

Recognizing

- (i) the successful implementation of the Joint IOC-UNEP Marine Pollution Assessment and Control Programme for the Wider Caribbean (CEPPOL),
- (ii) the importance of the CEPPOL Programme and other activities within the IOCARIBE MPRM Programme to contribute to the objectives and activities recommended by UNCED in particular Agenda 21, Chapter 17 and the Convention on Biodiversity,
- (iii) the important relationship with the Ocean Processes and Climate (OPC) Programme,

Endorses the reports from the IOC-UNEP/CEPPOL Workshop on Monitoring and Control of Pollution by Oil and Marine Debris in the Caribbean, the IOC-UNEP-NOAA-EPA-Sea Grant-IMO Second Marine Debris Workshop, the IOC-UNEP-ARPEL-IMO CEPPOL Oil and Marine Debris Evaluation Meeting and the Marine Debris Action Plan for the Caribbean;

Recommends

- (i) the IOCARIBE Secretariat to maintain the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring as scientific and technical advisory body to provide inputs to the IOCARIBE Secretariat and the CEPPOL Group of Experts,
- (ii) that the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring should operate continuously in co-operation with the IOCARIBE Secretariat, mainly by correspondence,
- (iii) that the CEPPOL Programme should be modified in accordance with relevant outcomes from UNCED 1992, in particular Agenda 21, Chapter 17 and the Convention on Biodiversity;

Requests the IOCARIBE Member States to support and widely distribute the Marine Debris Action Plan for the Caribbean to relevant institutions and authorities for immediate implementation of proposed Action items;

Further requests IOC and IOCARIBE to make all efforts to obtain additional funding for the CEPPOL Programme;

Urges all IOCARIBE Member States to fully support the CEPPOL Programme and co-operate with the IOC/IOCARIBE Secretariat with the objective to seek support for the CEPPOL Programme from the Global Environmental Facility (GEF).

Recommendation SC-IOCARIBE-IV.3

**REGIONAL COMPONENT OF THE IOC-UN (OALOS) PROGRAMME ON
OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)**

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

Noting that the majority of the countries in the area have identified OSNLR problems as of a high priority and are carrying out studies in this field,

Acknowledging the socio-economic impact of erosion and sedimentation problems in the Caribbean and Adjacent Regions,

Taking into account the recommendations approved during the Havana Mini-Symposium (1986) adopted during SC-IOCARIBE-II (1986), the course given in Cartagena (1988), and those of the Third Session of the Guiding Group of Experts on OSNLR held in Bordeaux (1989), as well as the Recommendations adopted during SC-IOCARIBE-III in Caracas (1989); and, the project proposal elaborated by the *ad hoc* Group of Experts in La Havana (1990),

Considering the few modifications introduced to the project proposal during the IOCARIBE/OSNLR Experts Consultation (Cartagena, August 1992) which are related to point "A" of Chapter 17 of UNCED's Agenda 21, and the proposal put forward by the same consultation to organize the first Workshop of the proposal in Trinidad and Tobago during the second trimester 1993,

Endorses the Project Proposal "Global Change and Coastal Land Loss: Management and Decision-making in Support of a Sustainable Development in the Caribbean and Adjacent Regions";

Urges the IOCARIBE Focal Points of the ACP States Group of the CEC to support the Project Proposal through the ACP Secretariat in Brussels;

Recommends the IOCARIBE Secretariat:

- (i) to establish a IOCARIBE Group of Experts for OSNLR to be in charge of the follow up of the Project Proposal,
- (ii) to support all activities of the regional OSNLR programme with strong Training, Education and Mutual Assistance (TEMA) elements, in particular, the first Workshop of the Project Proposal to be held in Trinidad and Tobago in the second trimester of 1993.

Recommendation SC-IOCARIBE-IV.4

INTEGRATED MANAGEMENT AND SUSTAINABLE DEVELOPMENT OF COASTAL AREAS, INCLUDING EXCLUSIVE ECONOMIC ZONES

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

Recalling that Chapter 17 of Agenda 21 of UNCED:

- (i) Stresses that the marine environment - including the oceans and all seas and adjacent coastal areas - forms an integrated whole that is an essential component of the global life supporting system and a positive asset that presents opportunities for sustainable development,
- (ii) Emphasizes that the coastal area contains diverse and productive habitats which are important for human settlement, development and local subsistence,
- (iii) Recognizes that, despite national, sub-regional, regional and global efforts, current approaches to the management of marine and coastal resources have not always proved capable of achieving sustainable development, and coastal resources and the coastal environment are being rapidly degraded and eroded in many parts of the world,

Recalling that in order to achieve solutions to the problems affecting the coastal and EEZ zones, UNCED requests coastal states should commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction,

Approves the recommendation of the Seminar "Rio 92-Strategy and Action Plan of IOC; projection for IOCARIBE" requesting the development of a new IOC global programme with components in the IOCARIBE region, linked and co-ordinated with UNESCO and other specialized agencies programmes dealing with this relevant issue;

Recommends that this programme includes an interdisciplinary oceanographic approach to an integrated management and sustainable development of coastal areas including marine zones under national jurisdiction;

Requests the Secretary IOC to take the necessary actions so as to make this new programme a worldwide known IOC initiative further supportive of UNCED decisions. In this context, recommends that a small *ad hoc* Group of Experts be composed with international specialists so that a proposal presented to the IOC Executive Council and Assembly.

Recommendation SC-IOCARIBE-IV.5

**REGIONAL COMPONENT OF THE IOC-FAO PROGRAMME ON OCEAN
SCIENCES IN RELATION TO LIVING RESOURCES (OSLR)**

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

Noting with satisfaction the progress made in the theoretical, conceptual and methodological framework of TRODERP in the IOCARIBE region, in particular regarding the proposals and recommendations made during the Workshop in Caracas (September 1989) to define IOCARIBE-TRODERP proposals,

Emphasizing the comprehensive nature of research ecosystems related to the study of recruitment of tropical demersal species,

Recalling the great economic and ecological importance for Member States of the region of resources encompassed in the SOAR, FEDERP, PREP and CORDERP sub-projects,

Endorses the proposal by the Chairman of the Group of Experts IOCARIBE/TRODERP to re-vitalize the recommendations from the Caracas Workshop (September 1989) regarding the IOCARIBE/TRODERP proposals;

Instructs the IOCARIBE Secretariat to develop an adequate strategy so that TEMA components be considered in methodological and intercalibration training courses pertaining to recruitment studies within the pertinent TRODERP sub-projects;

Instructs further the IOCARIBE Secretariat to explore possibilities for reshaping the IOCARIBE Group of Experts on OSLR-TRODERP so as to incorporate aspects related to red tides and harmful algal blooms, ecological coastal zone management and highly migratory and straddling species;

Requests the IOCARIBE Secretariat to distribute, as soon as possible, the dates and objectives of workshops in the next intersessional period so as to promote maximum participation from Member States and to seek the necessary funding for these events within the framework of regional OSLR sub-projects;

Requests IOCARIBE Member States to organize OSLR national technical committees in order to: establish working groups, develop inventories of relevant data, implement standardized methodologies and develop specific work plans and budgets;

Demands further IOCARIBE Member States, that results of OSLR national technical committees be informed to the IOCARIBE Secretariat so as to be conveyed to the regional Group of Experts;

Recommends to IOC that the OSLR regional projects be supported in all aspects required for its implementation and **requests** that the regional Group of Experts and sub-project co-ordinators develop with the assistance of the IOCARIBE Secretariat the four TRODERP sub-projects in order to submit them to potential funding agencies.

Recommendation SC-IOCARIBE-IV.6

REGIONAL COMPONENT OF THE GLOBAL OCEAN OBSERVING SYSTEM (GOOS-IOCARIBE)

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

Noting:

- (i) the results from the United Nations Conference on Environment and Development (UNCED), in particular Chapter 17 of Agenda 21,
- (ii) the efforts of IOC, WMO, and UNEP to develop the Global Ocean Observing System (GOOS), and
- (iii) the ongoing process to develop global, sub-regional, regional and national action plans for the implementation of GOOS and the importance for the study of Large Marine Ecosystems of the Wider Caribbean area,

Recommends

- (i) the IOCARIBE Member States to fully support and actively participate in the development and implementation of a regional component of GOOS in the Caribbean and Adjacent Regions, in particular to establish a GOOS Sea-Level Pilot Project modeled on the TOGA Sea-Level Project;
- (ii) that the IOCARIBE Group of Experts on OPC provides guidance and technical support for the implementation of GOOS to the IOCARIBE Sub-Commission and Member States in the transition period until a regional GOOS component has been formally established;

Urges

- (i) the IOC and IOCARIBE Secretariats to provide guidance to Member States about the implementation of GOOS in the region;
- (ii) the IOC and IOCARIBE Secretariats to organize an advisory mission on GOOS to selected IOCARIBE Member States;
- (iii) the Member States to establish the necessary national coordination Mechanism and to nominate a National Focal Point for GOOS, and
- (iv) the IOCARIBE Member States to include, as far as possible, elements in national projects which can contribute and benefit GOOS.

Recommendation SC-IOCARIBE-IV.7

STRENGTHENING OF TEMA AND ACTION PLAN FOR TEMA IOCARIBE

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

Recalling that the United Nations Conference on Environment and Development (UNCED) noted that, in order to achieve sustainable development in marine and coastal areas, the coastal states, in particular the developing states, need human and material resources as well as adequate funding, as expressed in various documents, specially in chapter 37, 36 and, in particular Chapter 17 of Agenda 21,

Recalling further that this need is equally stated in the United Nations Convention on the Law of the Sea (UNCLOS),

Recalling also that, being aware of this need, the Intergovernmental Oceanographic Commission (IOC) of UNESCO established in 1973 the Committee for Training, Education and Mutual Assistance (TEMA),

Noting Resolutions XVI-13 and 12, calling for the strengthening of the TEMA Programme and of high level specialist training in basic marine sciences, respectively,

Noting in particular the general content and specific recommendations of the Five Sessions of the TEMA Committee,

Recalling the general and the specific recommendations of the IOCARIBE Sub-Commission and IOCARIBE Association as well as those of the Co-operative Investigations in the Caribbean and Adjacent Region Programme (CICAR), on the need and convenience that an IOC projects in the region should always include a Training, Education and Mutual Assistance component,

Taking into account in particular Recommendation SC-IOCARIBE-I.6 related to the establishment of a regional network for marine sciences education and research institutions,

Considering the decisions of the first and the second IOCARIBE officers meetings, as well as the recommendations from the Seminar Rio-92 - Strategy and Action Plan of IOC-Projections for IOCARIBE" and the suggestions included in document "IOCARIBE TEMA Strategy and Development" (draft),

Endorses the suggestions and recommendations included in the above mentioned documents;

Approves the establishment of a TEMA Action Plan and Strategy for the region, in which the following elements should be included: justification; objectives; main activities to be developed; strategy of execution; and, budgetary considerations following the TEMA Action Plan and Strategy approved during the Fifth Meeting of the IOC TEMA Committee;

Recommends that the Action Plan should include the following pilot projects:

- (i) Development of national marine sciences country profiles,
- (ii) Development of IOC national IOC structures for contacts,
- (iii) Identification and utilization of already existing co-operative mechanisms in the region;

Also recommends that the Action Plan should emphasize particularly on the following aspects: diagnosis on the present state of marine sciences and technology in the Member States; development of marine programmes in the framework of the outcomes of UNCED; training courses at all levels; utilization and improvement of already existing regional facilities, both human and material; strengthening the regional networking starting with the establishment of a network for high level education and research institutions; strengthening the regional "partnership"; strengthening and updating of services including the use of new technologies;

Urges the IOC and IOCARIBE Secretariats to take the necessary measures in order to establish and implement the TEMA Action Plan.

Recommendation SC-IOCARIBE-IV.8

STRENGTHENING OF THE IOCARIBE SECRETARIAT

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

Recognizing the considerable progress made in developing the IOCARIBE Programmes and the importance of IOCARIBE as a regional co-ordinating body,

Noting the required role of IOCARIBE in contributing to UNCED at the regional level, in particular to the Framework Convention on Climate Change, the Biodiversity Convention, and specially Agenda 21, through its programmes in Ocean Science, Ocean Services and TEMA,

Concerned about the difficulties, in particular financial and communications, which have hampered the accomplishment of some important objectives for the region, as those related to TEMA,

Also concerned about the anticipated departure of the IOCARIBE Secretary and one Long-Term Consultant:

Urges the Secretary IOC to urgently initiate the steps, involving the Chairman IOC, to request the Director General of UNESCO to take the necessary actions

- (i) to ensure retention of the IOCARIBE Secretary position in Cartagena,
- (ii) to consider transforming the current IOCARIBE Secretary position P-5, into two positions at the P-4 and P-3 levels to ensure a minimum level of adequate permanent staffing at the IOCARIBE Secretariat;

Insists to the Secretary IOC to continue to seek the means for the IOCARIBE Secretariat, Officers, and Experts responsible for the scientific programmes, to have adequate communication facilities, in particular electronic mail.

ANNEX III/ANEXO III

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ANNEX IV

OPENING STATEMENT BY DR. GUNNAR KULLENBERG, SECRETARY IOC

Mr. Chairman, Honoraries, honoured Delegates, guests, ladies and gentlemen,

It is an honour for me to be here today at the opening of the Fourth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions. It is a pleasure to see that our hosts have made such excellent arrangements and an honour for me to thank you, the Government of Mexico and the region of Veracruz. I certainly look forward to renewed and continued increased participation and involvement of Mexico in IOC and IOCARIBE. It is also a pleasure for me to see that the IOCARIBE Secretariat functions so well.

This is the Third Session of the Sub-Commission which I attend; the first one was in Cuba in December 1986, the second one in Caracas in December 1989 and now here in December 1992. The intervals are almost perfectly 3 years. I would like to make some reflections in light of this.

First, what is the IOC?

The IOC is the only Intergovernmental Organization solely charged with dealing with the oceans, coastal areas and the whole marine environment and its resources.

The purpose of the IOC is to promote marine scientific investigations, systematic ocean observations, related ocean services, and capacity building with a view to learn more about the ocean, the nature of its resources so as to obtain the knowledge and information basis for sound management and sustainable development.

In order to obtain this the IOC must truly become an organization involving Member States, its Governing bodies and the Secretariat working together towards the goal.

The Sub-Commission has a similar purpose for the region, drawing on the Global Organization so as to be a whole and again working with the active involvement and participation of Member States, the governing body, that is this body, and the Secretariat. Without this tripartite constellation the organization will not function.

The IOC or IOCARIBE are not responsible for the preparation of legal instruments, conventions but they are entrusted with the provision of the fact-finding elements necessary for the preparation of such management acts and control measures. A sound decision making process needs certain basic facts to work and there are many examples of this. Get the science right and the rest will fall in place.

A major achievement during this period is confirmation of the possibility to forecast seasonal and inter-annual climate variabilities through a combination of systematic, scientifically sound, ocean observations, and coupled atmosphere-ocean models capable of using the assimilated data. This major achievement was realized by WCRP-TOGA, which IOC is co-sponsoring with WMO and ICSU. Its usefulness at the national level has been demonstrated by its application to the management of agriculture and fisheries in Peru and can be applied in this region to improved forecasting of cyclones. The result would appear to confirm that once the science base is reasonably accurate, and an information base is available in the form of reliable data, then well-grounded management decisions can be made. Such progress is also an example of the possibilities provided by international research and observational efforts, developed and co-ordinated through agreed intergovernmental procedures, to help anticipate and forecast environmental events which otherwise would lead to disasters and possible conflicts. Other examples of events which we may soon be able to anticipate adequately and forewarn include droughts and shifts in seasonality, and soon variability and cyclone frequency.

The ability to adequately forecast these variabilities, as well as climate zone changes, is the essence of preventing environmentally driven disasters and conflicts. The work required in achieving these results is in line with the reinforced peace-keeping role of the United Nations, and IOC has been instrumental in this

respect through its support to the work of the Joint SCOR-IOC-CCCO, its support to that of TOGA and WOCE, and to related efforts in capacity - building and training.

Much efforts were devoted by the IOC to the preparation and participation in UNCED, Rio de Janeiro. UNCED is a process. UNCED confirmed that in the context of an action-oriented programme focussing on environment and development, the oceans cannot be considered without taking into account their links and interactions with the rest of the planet. The Conference also clearly recognized the critical role the oceans play in maintaining conditions of life on Earth; that without healthy oceans there is no healthy global or regional environment; that the present understanding of interactions between the oceans, the land (especially coastal zone) and the atmosphere is insufficient for adequate forecasting of changes and consequences of human actions.

UNCED put capacity building in focus, including the development of increased knowledge; education, research, infrastructure, equipment, expertise. It recognized that the establishment of knowledge and the capacity to use it means much for the social and cultural development of a country. Capacity building in poor countries is therefore most important.

UNCED in several ways also acknowledged that sustainable development and rationale use, or management, of natural resources requires an information basis which has been obtained through the use of scientifically valid methods. Sustainable use of natural resources must be founded on knowledge about the resources base, origin, function and dynamics. This knowledge includes certain elements of understanding. However, UNCED also stressed that decisions will often have to be made on incomplete information, or under pressure of uncertainties: the scientific input is required but incomplete scientific understanding should not be an impediment to action. An integrated approach in which all relevant factors are taken into account is encouraged. For oceans and seas in particular, the need to address uncertainties and establish a reliable information base, systematic observations and increased knowledge was stressed.

Mr. Chairman, let me reflect a bit on the IOCARIBE development. At the Second Session the Sub-Commission had 8 Member States present. It passed 8 recommendations, of which I think mainly one has been fully implemented and elements of the others. Two of the resolutions contain statements urging Member States to participate.

The Third Session of the Sub-Commission had 11 Member States present. The Session passed 8 resolutions, of which 6 have been by and large implemented and elements of the others. Dr. Robles will of course provide more information on this. Four of the recommendations directed statements to Member States, requiring active participation of Member States.

The Session also endorsed the IOCARIBE Medium-Term Plan and Dr. Robles will report on its implementation. I would like to say that it was financially an unrealistic plan. It has not been possible to obtain the funds required. This must be seen in the light of our development. Where are we going to obtain funds? Mainly where we have co-operation and joint programmes of mutual interest, where we have alliances and use the complementarity of organizations, programmes or bodies. Examples are CEPPOL, the International Musselwatch and the regional network of observations. The key words here are specified needs, alliances, complementarity, I would add, compatibility.

We have received funds from several countries and donors of that category, Swedish SAREC, Canadian ICOD, US NOAA, US EPA, US Coast Guard, Swedish SIDA. The experience shows clearly that this requires involvement by the Member States concerned to talk with the donors, help to establish the dialogue, open the door. It also shows that we must be realistic in our goals and have credibility.

We must get Member States involved and we cannot develop the science in isolation from the rest of society.

What are now the issues?. A major factor for our credibility is now to contribute towards the follow-up to UNCED including Agenda 21, the FCCC and the Convention on Biodiversity. The IOC is referred to specifically in Chapter 17 of Agenda 21, and the IOC should also contribute towards the implementation of the Conventions, where research, systematic observations, education, capacity building are all basic elements. We must help mobilize the scientific community to take part actively in this. Again, in order to achieve this we have to work both internationally and nationally. It is very important that national delegations to negotiating mechanisms are aware of IOC, IOCARIBE and what we can do; just as in the case of the

national delegations to our co-operating partners - UNEP, IMO, IAEA, WMO and others. The importance of this and that it can be achieved was shown in the UNCED preparations and process.

Major issues for the marine environment can be defined on the basis of the UNCED results. Several of those have also been identified for the Caribbean region specifically, e.g., by the CARICOM Ministers Conference.

The population pressure on the coastal area is increasing, especially in tropical and sub-tropical zones. About two billion people, mostly in the poorest countries, are wholly dependant on marine protein; 50 - 90% of the protein in developing countries comes from marine fisheries. In the tropical coastal zones exist some of the most productive ecosystems, coral reefs, estuaries, mangroves, seagrass beds, lagoons, etc. These systems are of the central importance for the marine productivity in those areas. At the same time those ecosystems are subject to accelerating degradation and depletion, putting their production and protein sources for the population at risk.

Marine pollution and effects of land-based activities on coastal zone conditions are major problems in most regions of the world. This threatens the natural resources in the coastal zone. This issue is of course linked to the first issue. There is also a certain degradation in open shelf sea areas and contamination in the open oceans. The contamination passing the largest threats are at present: sewage, overload of nutrients, synthetic organic compounds, overload of land derived sediments, litter and plastics. At a lower level of concern are metals, radionuclides, oil/hydrocarbons and polycyclic aromatic hydrocarbons. The effects of climate variability and change are potentially very important for the coastal area, through changes of sea level, meteorology, seasonality, precipitation levels, events like storm surges, cyclones, shifts in marine living resources, coastal erosion and general degradation.

The role of the oceans in the climate system and the possibility of forecasting climate changes and variability from adequate ocean observations and modelling can, in combination with economical modelling, help remedy impacts of changes and define economically valid counter measures and useful response strategies.

Changes in radiation budget, and especially UV radiation can influence the productivity of the marine ecosystems and their composition. This cannot yet be quantified.

Maintenance of marine living resources in coastal and shelf seas and open oceans; this issue is mainly related to management of fisheries - i.e., of those doing the fishing.

Maintaining the biological diversity and ecosystem integrity in heavily exploited and stressed nearshore and coastal ecosystems e.g., lagoons, wetlands, estuaries, mangroves, seagrass beds, coral reefs and certain fish species in areas of over fishing, as well as certain marine mammals.

The ocean and marine environment users are intersectorial and normally there is no single national authority dealing with marine affairs. Many different sectors of society has an interest in this part of the environment. This implies that ownership is difficult to establish, and the view is often that oceans and the marine and coastal environment are common heritage. This in turn implies open access, and associated lack of responsibility of many users. This is well demonstrated in present coastal area problems. This issue is national as well as international, and concerns inter alia, economics, institutions, educational and cultural awareness.

The IOCARIBE Programmes cannot cover all this, of course, but it does include several elements. It is now the task to adjust the existing Medium-Term Plan, on basis of experiences and taking into account UNCED and the issues I referred to so as to come up with a scientific and realistic plan for the coming 3 to 4 years. I wish you all a successful session.

Thank you.

ANNEX V

WORKSHOP ON SMALL ISLAND OCEANOGRAPHY IN RELATION TO SUSTAINABLE ECONOMIC DEVELOPMENT AND RELATED COASTAL AREA MANAGEMENT

French Antilles, November 1993

Organized by the
Intergovernmental Oceanographic Commission of UNESCO and its
Sub-Commission for the Caribbean and Adjacent Regions and the
Caribbean Environmental Programme of UNEP

DESCRIPTION

Small tropical and subtropical islands are particularly attuned to the effects of the surrounding ocean and the atmosphere. Frequently these islands are densely populated and rely on the sea for sustenance and economic viability. Oftentimes too, individual island nations do not have the resources to address the issues in oceanography and marine meteorology that are central to their future well being. UNCED (Agenda 21, Chapter 17 G) and the UN General Assembly have recognized some of these issues by calling a "Global Conference on the Sustainable Economic Development of Small Island States" for April, 1994.

Regional bodies of United Nations agencies are aware of their role in creating the infrastructure to collaborate with natural scientists and resource managers. This workshop addresses this need with particular attention to the effects of the ocean and atmosphere on small tropical and subtropical islands and their economic sustainability. The biology, chemistry, geology, and physics of the ocean and the lower atmosphere are intertwined with the economics and health of small islands, thus demonstrating that an integrated approach to management is required for sustainable development. An interdisciplinary scientific workshop is envisioned that includes equally marine scientists, and government and business decision-makers with environmental responsibilities.

The Workshop will last for 3 days and will primarily include invited papers in each of the disciplines mentioned above, covering time-scales ranging from those associated with storm damage and hazardous spills, to decade and longer climate change. The concentration will be on quantitative effects and the use of numerical models in understanding and predicting the influence of oceanic and atmospheric events on small islands and their marine environs. A series of case studies are planned to be presented and discussed. Scientific sessions will emphasize transfer of information and application of models to the decision-making sectors. The Workshop proceedings will be edited into a publication that will particularly be made available to the Global Conference on Sustainable Economic Development of Small Island States mentioned above.

The Workshop will emphasize quantitative models where the ocean's physical variability is coupled to bio-geochemical economic effects. Envisioned are a series of nested numerical models each providing the boundary conditions from a coarse-resolution regional circulation model to a fine-resolution island-scale circulation model to a cellular automata socio-economic decision support model. Some of these models are PC based, and thus are amenable to the available resources on most developing island states.

A typical day during the Workshop will start with one or more invited lectures on a topic followed by contributed papers on the same topic. After the technical session, working groups will be created to discuss in depth the presentations, and to formulate needed capacity building programmes with research topics and technology transfer. Plenary sessions will be used to share the working group deliberations and to debate their conclusions. On-going report writing will insure a draft final report for plenary discussion.

The potential role of the Global Ocean Observing System (GOOS), will constitute one workshop session. Reports on the status of monitoring networks will be reviewed and the implementation of GOOS will be discussed on a case by case basis. Specific recommendations will be made, and a funding and implementation plan will be developed.

Participation in the workshop is primarily by invitation, but interested scientists are encouraged to contact the appropriate member of the organizing committee. In order to accomplish the workshop's goals, participation of approximately 25 persons is expected. Those requiring financial assistance and lodging information should contact the IOC Senior Assistant Secretary for IOCARIBE, A.A. 1108, Cartagena, Colombia (Tel: (57) (53) 64 63 99; Fax: (57) (53) 65 03 95).

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ANNEX VI/ANEXO VI

LIST OF ACRONYMS AND ABBREVIATIONS/LISTA DE ACRONIMOS Y ABREVIATURAS

| | |
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| ACP | Africa, Caribbean and Pacific |
| ARPEL | Association of State Oil Corporations for Latin America and the Caribbean/Asociación Recíproca Petrolera Estatal Latinoamericana |
| CARIPOL | Caribbean Pollution Monitoring Programme |
| CEC | Commission for the European Communities |
| CCE | Comisión de las Comunidades Europeas |
| CICAR | Co-operative Investigations in the Caribbean and Adjacent Regions Programme/Programa de Investigaciones Cooperativas en el Mar Caribe y Regiones Adyacentes |
| CEP | Caribbean Environment Programme (UNEP) |
| CIOH | Centro de Investigaciones Oceanográficas e Hidrográficas (Colombia) |
| CNUMAD | Conferencia de las Naciones Unidas para el Medio Ambiente y el Desarrollo |
| CEPPOL | Marine Pollution Assessment Control Programme for the Wider Caribbean |
| CINVESTAV | Centro de Investigaciones y Estudios Avanzados (Mexico) |
| COI | Comisión Oceanográfica Intergubernamental |
| CONALMEX | Comisión Nacional de Mexico |
| CORDERP | TRODERP Sub-Project on Coral Reef Demersal Recruitment |
| EPA | Environmental Protection Agency (USA) |
| FEDERP | TRODERP Sub-Project in Fish Estuarine Deltaic Recruitment |
| GEF | Global Environmental Facility/Facilidad Mundial para el Medio Ambiente |
| GGE | Guiding Group of Experts/Grupo Guía de Expertos |
| GOOS | Global Ocean Observing System/Sistema Mundial de Observaciones Oceánicas |
| GLOSS | Global Sea-Level Observing System |
| GCOS | Global Climate Observing System |
| HAB | Harmful Algal Blooms/Floraciones Nocivas de Algas |
| IAEA | International Atomic Energy Agency |
| IBCCA | International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico/Carta Batimétrica Internacional del Mar Caribe y Golfo de México |
| IMO | International Maritime Organization |
| IOC | Intergovernmental Oceanographic Commission |
| IOCARIBE | IOC Subcommission for the Caribbean and Adjacent Regions |
| IPID | Integrated Planning and Institutional Development |
| IREP | International Recruitment Experiment |
| MARPOLMON | Marine Pollution Monitoring Programme |

| | |
|--------------|---|
| NGOs | Non Governmental Organizations |
| NOAA | National Oceanic and Atmospheric Administration (USA) |
| NMFS | National Marine Fisheries Service of NOAA (USA) |
| OPC | Ocean Processes and Climate |
| OSNLR | Ocean Sciences in Relation to Non Living Resources/Ciencia Oceánica en Relación a los Recursos No Vivos |
| OSLR | Ocean Science in Relation to Living Resources/Ciencia Oceánica en Relación a los Recursos Vivos |
| PNUD (UNDP) | Programa de las Naciones Unidas para el Desarrollo/United Nations Development Programme |
| PNUMA (UNEP) | Programa de las Naciones Unidas para el Medio Ambiente/United Nations Environment Programme |
| PREP | TRODERP Sub-Project on Penaeids Recruitment |
| RCU/CEP | Regional Co-ordination Unit for CEP (UNEP) |
| SAREC | Swedish Agency for Research Co-operation |
| SIDA | Swedish International Development Authority |
| SOAR | Satellite Ocean Analysis for Recruitment |
| SPAW | Specially Protected Areas and Wildlife Reserves |
| TEMA | Training, Education and Mutual Assistance/Capacitación, Educación y Asistencia Mutua |
| TRODERP | Tropical Demersal Recruitment Project |
| TOGA | Tropical Ocean and Global Atmosphere (WMO/IOC) |
| UN | United Nations |
| UNAM | Universidad Nacional Autónoma de Mexico |
| UNCLOS | United Nations Convention on the Law of the Sea/Convencion de las Naciones Unidas sobre el Derecho del Mar |
| UNCED | United Nations Conference on the Environment and Development |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization/Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura |
| WB | World Bank |
| WMO | World Meteorological Organization |