



IOC Sub-Commission for the Caribbean and Adjacent Regions

Third Session

Caracas, Venezuela, 4-8 December 1989

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Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

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Unesco

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1. OPENING

- 1 The Third Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions was called to order by Captain Rafael Steer-Ruiz, Chairman of the Sub-Commission at 9.15 on 4 December 1989, Room 2, Parque Central, Caracas, Venezuela.
- 2 The Venezuelan Minister of State for Science and Technology, and President of the Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICIT), Dr. Dulce Arnao de Uzcategui, welcomed the participants to SC-IOCARIBE-III. She stressed that Venezuela's marine vocation dates from its very beginning as a nation. She underlined the growing interest of the Venezuelan Government in all activities related to the ocean and mentioned several ways in which the Government has offered this support. As an example, she made particular reference to the establishment and implementation of a new body responsible for the co-ordination of marine activities in Venezuela, the "Comision Nacional de Oceanologia", which is an advisory body to the Presidency of the Republic in matters related to ocean science and technology. The Minister also emphasized the importance of the items included in the Agenda for the countries of the Region. She concluded by formally inaugurating SC-IOCARIBE-III and wishing the participants every success.
- 3 The Chairman responded recalling that here in Parque Central, Caracas, and under the hospitality of the Venezuelan Government, the CICAR programme ended and the IOCARIBE Association was established. In turn, the Association became the Sub-Commission, created in 1982 by Resolution XII-16 representing this step a substantial new approach in the administrative regional structure of the IOC. He also mentioned that at the beginning, the Sub-Commission went through a difficult period, during the process of decentralization and establishment of the regional Secretariat, but has now been able to cover all the regional components of the IOC global programmes. Likewise, he highlighted the importance of the presence of Dr. Gunnar Kullenberg, Secretary IOC, at the Session. Lastly, the Chairman stressed that in order to continue its expansion, IOCARIBE should: (i) increase involvement of Member States; (ii) make use of the IOCARIBE Secretariat in the most efficient possible way; (iii) give special attention to the regional programmes, as well as regional components of IOC global programmes. The Chairman ended by thanking the Venezuelan Government for the hospitality offered in hosting SC-IOCARIBE-III and the successful local organization of the meeting.
- 4 The Secretary of IOC, Dr. Gunnar Kullenberg, also expressed his gratitude and thanks to Venezuela for hosting the Session. He explained the reasons why this Session carries such an importance. The meeting takes place in a time when indications of human induced global changes of our environment is gaining increased attention. The role of the oceans and the marine environment in global and regional climatic changes is now uncontested. To obtain reliable observations, which for the time being are missing, efforts are being made by IOC in collaboration with WMO and UNEP to develop an appropriate Ocean Observing System. Many of the problems associated with this scenario were to be discussed in this Session. Dr. Kullenberg then called upon the governmental representatives present to evaluate, endorse and consider these issues as priority actions in their respective countries.

5 Dr. Salvano Briceño, Co-ordinator of the Caribbean Environment Programme of UNEP, addressed the meeting on behalf of the international organizations that co-operate with IOCARIBE and expressed his satisfaction with this co-ordination, highlighting the relevance of IOCARIBE's mission in support of the marine scientific community of the region. He also expressed the need of utilizing more actively, mechanisms such as the CEP for strengthening regional co-operation and briefly described the main areas in which both programmes are working together, including the regional effects of global climate changes, and assessment and control of marine pollution.

6 The List of Participants is provided in Annex III.

7 A List of Acronyms and Abbreviations is given in Annex IV.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

8 The Provisional Agenda (Document SC-IOCARIBE-III/1 Prov.) was submitted to the Sub-Commission for approval. It was noted by the US Delegation that, according to the Summary Report of the Second Session of the Sub-Commission, a written report on the intersessional activities of each Member State should be presented at the present Session. The Chairman asked delegations present to provide the Secretariat with an abstract of these presentations to be included as an Addendum of the Report on Intersessional Activities (Doc. SC-IOCARIBE-III/6), and give a short verbal account under Agenda Item 3.

9 The Agenda as adopted, is presented in Annex I.

2.2 DESIGNATION OF RAPPORTEURS FOR THE SESSION

10 The Chairman explained that two Rapporteurs should be designated, one in the Spanish language and the other in the English language. He proposed Dr. Gregorio Reyes Vasquez of Venezuela as Rapporteur in Spanish and Mr. Bengt Axelsson of the IOCARIBE Secretariat as Rapporteur in English. These proposals were accepted by the Sub-Commission.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

11 The IOC Senior Assistant Secretary for IOCARIBE and Technical Secretary of the Session, Dr. Fernando Robles, briefly described the administrative arrangements for the Session and presented a Provisional Timetable for the five days of activities. Two additional activities were included: a scientific presentation of Dr. George Maul of the US Delegation on "Interdisciplinary Research Aspects of Ocean Processes and Climate" and a presentation of Dr. Gaspar Gonzalez-Sanson of the Cuban Delegation on "Characteristics and Results of the First Oceanographic Interdisciplinary Research Programme carried out onboard the R/V "Ulises" in Cuban waters (September 87-August 89)".

12 The Sub-Commission decided that an ad hoc Working Group should be formed, with Dr. Manuel Murillo of Costa Rica as Co-ordinator, to provide inputs and comments to the IOCARIBE Draft Medium Term Plan (Document SC-IOCARIBE-III/8 rev.2).

13 The Technical Secretary explained that the following documents listed in SC-IOCARIBE-III/4 Prov. were also in preliminary form: IOCARIBE/WSH-TRODERP-I/3 and IOCARIBE/ISRP-I/3.

14 The Sub-Commission requested that the document 'on Interessional Activities from the First Meeting of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring (IOCARIBE/GE-MPRM-I/6) be also distributed to the participants of the Session.

15 The Chairman informed the participants of the Session that Barbados had officially applied for membership in IOCARIBE.

16 The Chairman also informed that a message had arrived from the Vice-Chairman, Dr. Barry Wade, regrettfully stating that he was unable to attend the Session.

3. REPORT ON INTERSESSIONAL ACTIVITIES

17 The Technical Secretary reviewed the activities undertaken since the last Session of the Sub-Commission (Havana, Cuba, 8-13 December 1986) described in Document SC-IOCARIBE-III/6.

18 The IOC Regional Secretariat for IOCARIBE was installed in March 1987, in offices provided by the Colombian Government in the "Casa del Marques de Valdehoyos" located in the "centro amurallado", Cartagena, Colombia.

19 The Colombian Government, following the Agreement signed between Unesco and the host country ratified by the Colombian Congress in December 1988, is now regularly providing operational funds for the functioning of the Secretariat.

20 The IOCARIBE Secretariat was officially inaugurated on 1 September 1989 with the presence of the Secretary of IOC, the Chairman of IOCARIBE, and the representative from the Ministry of Foreign Affairs of Colombia, plus local authorities.

21 As a contribution from the Government of Sweden, a new Associate Expert was provided to the Secretariat from April 1989 to support activities in the field of Marine Pollution Research and Monitoring.

22 The IOCARIBE Newsletter ("Iocaribe News") was established in the second half of 1989. It is planned that the Newsletter be issued quarterly in English, Spanish and French and distributed to National Focal Points, institutions and persons over the region who are involved and/or interested in IOCARIBE activities.

23 Missions of the Chairman and Vice-Chairman to selected Member

States were undertaken in order to inform about IOCARIBE activities and promote participation in SC-IOCARIBE-III.

24 The following Ocean Science activities were highlighted:

(i) **Physical Oceanography and Climate**

25 A detailed project proposal on Ocean Circulation in the Caribbean Sea and Adjacent Regions was elaborated, submitted and approved in principle by the European Space Agency (ESA) to be part of the ERS-1 investigators plan.

26 Central to this IOCARIBE project is an operational network of sea-level/weather stations throughout the region, a subset of which are GLOSS stations. Five tide gauges donated by NOAA to IOCARIBE Member States are being established in consultation with appropriate national authorities.

27 An "English-Spanish Bibliography in Physical Oceanography and Climate for the Caribbean Sea and Adjacent Regions" was prepared at the Atlantic Oceanographic and Meteorological Laboratory (AOML), NOAA, Miami, USA, and published as Document IOC/INF-783.

28 Through consultations between UNEP/RCU/CEP and IOC/IOCARIBE, a Regional Task Team was established to prepare a study on possible impacts of sea-level and sea-surface temperature changes, induced by expected climatic changes in the Wider Caribbean Region. The Task Team was invited to meetings in Kingston, Jamaica, 30 July -1 August 1987 and Miami, USA, 2-4 March 1988 to define inputs for regional assessment. A report will be published in the near future.

29 To further assess impacts of climatic changes, the IOCARIBE Secretariat, in consultation with regional experts, has been developing a major project proposal on associated effects of sea-level rise, sea-surface temperature changes, ocean-transport processes and other environmental changes. The proposal entitled Climate Changes Impacts and Ocean Physical Processes was finalized as part of the Interdisciplinary Seminar on Research Problems in the IOCARIBE Region, Caracas, Venezuela, 28 november - 1 December 1989, (Doc. IOCARIBE/ISRP-1/3), which comprised the following main elements: Physical Oceanography and Climate Changes; Coastal Sedimentation Mechanisms and Erosion Problems; and Dispersion of Pollutants in certain key areas.

(ii) **Marine Pollution Research and Monitoring**

30 The IOCARIBE Regional Component of the GIPME-MARPOLMON-CARIPOL Petroleum Pollution Monitoring Programme has continued to be most successful and up-to-date about 11,000 data points on beach tar, floating tar, dissolved and dispersed petroleum hydrocarbons (DDPH's) have been reported to the Regional Data Bank.

31 The successful implementation of the IOC/UNEP assisted CARIPOL Petroleum Monitoring Project has been possible through the strong voluntary support of individual experts, laboratories and Member States participating in the programme and the technical assistance and support provided by IOC

and UNEP. Through Training Courses, Seminars and individual training, the number of scientists trained in CARIPOL monitoring techniques and the number of institutions supporting the regional component of GIPME/MARPOLMON in the Caribbean, have increased.

32 The Joint IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Monitoring, Research, Control and Abatement in the Wider Caribbean Region was held in San Jose, Costa Rica, 24-30 August 1989. The Workshop was attended by 40 regional experts from 17 countries and representatives from international organizations who developed the framework for a joint IOC-UNEP Regionally Co-ordinated Comprehensive Programme for Marine Pollution Assessment and Control for the Caribbean (CEP POL).

33 In order to implement the CEP POL Programme, a regional network of environmental institutions in the Caribbean will be formalized. The experiences and institutional network developed within the CARIPOL Programme will serve as a solid basis for the new CEP POL Programme and the IOCARIBE Secretariat has initiated the process to formalize the existing network of participating institutions and Member States.

34 The First Session of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring was convened the 29 August 1989 in San Jose, Costa Rica. The meeting discussed the ongoing CARIPOL Programme and recommended that a monitoring programme on Marine Debris should be included in CARIPOL-I. A pilot project has been initiated and the capabilities at the IOCARIBE Secretariat being improved to serve as a regional data bank for this programme.

35 The IOCARIBE Secretariat has actively been involved in the work of the UNEP-IOC Task Team on Implications of Climatic Changes in the Wider Caribbean and has developed proposals to establish a monitoring network to follow impacts of climate and other environmental changes.

(iii) Ocean Science in Relation to Living Resources

36 To accelerate the implementation of TRODERP in the region, the IOCARIBE Secretariat organized an Ad hoc meeting of regional experts in Cartagena, Colombia, 19-21 May 1987, to examine and formulate concrete proposals. Three Sub-Projects on Fish Estuarine-Deltaic Recruitment (FEDERP), Coral Reef Demersal Recruitment (CORDERP) and Penaeids Recruitment (PREP) were developed, taking into consideration priorities for demersal regional resources, potential interest of Member States and relevant knowledge and research capabilities. A Workshop to further define these IOCARIBE-TRODERP Proposals was held in Caracas, Venezuela, 12-16 September 1989. The Workshop finalized the three original Sub-projects Proposals (FEDERP, CORDERP, PREP) and in addition, a Sub-project on Satellite Ocean Analysis for Recruitment (SOAR), including actions supporting the other three Sub-Projects.

37 Other activity on marine living resources co-sponsored by IOCARIBE, relates to the Second Western Atlantic Turtle Symposium (WATS-II, Mayaguez, Puerto Rico, 12-16 October 1987) with valuable scientific, economic and social implications for the region.

(iv) Ocean Science in Relation to Non-Living Resources

38 As a contribution to the Regional Component of the IOC-UN(OALOS) Programme on Ocean Science in Relation to Non-Living Resources, a Training Course on Knowledge and Management of the Coastal Zone and Near Continental Shelf in the Caribbean was held in Cartagena, Colombia 18 May - 3 June 1988.

39 Three main OSNLR topics of scientific interest were identified and developed:

(a) Flow of water and continental material to the sea; research and evaluation of their impact on coastal systems and the continental shelf.

(b) Evaluation of erosion and sedimentation processes in the immediate coastal zone in the IOCARIBE region.

(c) Management of coastal systems and regulatory measures in the IOCARIBE region.

(v) Ocean Mapping and the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico

40 The work with the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA) has made significant progress during the intersessional period.

41 The IBCCA Workshop on Data Sources and Map Compilation was held in Boulder, Colorado, USA, 18-19 July 1988 (IOC Workshop Report No. 55). The Workshop was followed by the Second Session of the IOC Editorial Board for IBCCA (Boulder, Colorado, USA, 20-22 July 1988 - Document IOC/EB-IBCCA-II/3).

42 The First Meeting of the Officers of IBCCA was held in Mexico City, Mexico, 22-24 May 1989. The meeting reviewed the progress made in the compilation of sheets No. 1-10 of the regional chart.

(vi) The following Ocean Services activities were described:

43 Efforts have been made in Member States to increase knowledge, local implementation and association to regional/global networks so as to develop the Sea-Level Observing System (GLOSS), the Integrated Ocean Services System (IGOSS), the International Oceanographic Data Exchange System (IODE), and participation in information systems such as Aquatic Sciences and Fisheries Information (ASFIS).

44 Considerable progress has been done in the region within GLOSS. A report on GLOSS development within IOCARIBE was presented at the First Session of the IOC Group of Experts on the Global Sea-Level Observing System (GLOSS), Bidston, UK, 19-23 June 1989.

45 Regarding Training, Education and Mutual Assistance (TEMA) activities, these elements have been considered without exception in most activities planned and carried out throughout the different regional

programmes. Assistance provided to Member States has been, in this context important for improving their national capabilities.

46 As regards co-operation with other organizations and programmes, collaboration with the UNEP Regional Seas Action Plan for the Caribbean Environment Programme has progressed steadily. The complementary nature of the co-operation with UNEP in the implementation of marine pollution research and monitoring activities resulted in a joint IOC/UNEP Project on "Assessment and Control of Marine Pollution in the Wider Caribbean Region", finalized at the Regional Workshop to Review Priorities for Marine Pollution Monitoring, Research, Control and Abatement in the Wider Caribbean Region in San Jose, Costa Rica, 24-30 August 1989, mentioned above.

47 The proposal for the CEP POL Programme will be submitted to the Fifth Intergovernmental Meeting of the Action Plan for the Caribbean Environmental Programme and the Second Meeting of Contracting Parties to the Cartagena Convention (Kingston, Jamaica, 10-18 January 1990).

48 The Sub-Commission endorsed the report on Intersessional Activities presented by the IOCARIBE Secretariat and instructed the Secretary to include as an Addendum to Document SC-IOCARIBE-III/6, presentations provided by Member States attending the Session, on corresponding national activities.

4. OCEAN SCIENCES

4.1 PHYSICAL OCEANOGRAPHY AND CLIMATE

49 The Convenor of the Physical Oceanography and Climate section of the Interdisciplinary Seminar on Research Problems (ISRP) in the IOCARIBE Region, Dr. George A. Maul, presented the relevant results and recommendations of the Seminar, held 28 November - 1 December 1989 in Caracas.

50 The results and recommendations were a consensus of four days of work between experts of Barbados, Cuba, France, USA, and Venezuela, and an extension of recommended actions provided by the IOCARIBE Workshop on Physical Oceanography and Climate (Cartagena, Colombia, 19-22 August 1986- IOC Workshop Report No. 45) which were approved at SC-IOCARIBE-II (Havana, 8-13 December 1986) and by the Fourteenth Session of the IOC (Paris, March 1987).

51 The relevant project proposal is contained in section 5.1 of the Summary Report of the Seminar (Document IOCARIBE/ISRP-I/3) and is entitled "Climate Changes Impacts and Ocean Physical Processes".

52 The Sub-Commission thanked Dr. Maul for his dynamic involvement in the Physical Oceanography and Climate Programme of IOCARIBE and other relevant activities of IOC, and for this presentation of the project proposal mentioned above.

53 The Sub-Commission endorsed the project proposal developed at the Interdisciplinary Seminar and recommended its submission to UNEP and Unesco for funding. The Sub-Commission stressed the need of co-ordination of this

initiative with WCRP programmes TOGA, WOCE, and with JGOFS, GLOSS and GLOBEC.

54 The Sub-Commission approved Recommendation SC-IOCARIBE-III.1.

4.2 MARINE POLLUTION RESEARCH AND MONITORING - REGIONAL
COMPONENT OF GIPME-MARPOLMON

55 Dr. Jorge Corredor, Chairman of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring, introduced this item.

56 A serious difficulty faced by the programme has been the regrettable - but understandable - decision made by Dr. Donald Atwood, of being unable to continue implementing the CARIPOL data base system in his laboratories at NOAA/AOML. Fortunately, Dr. Andrew Robertsson, Chief of Oceanic Assessment at NOAA, has agreed to receive data base information at NOAA's Maryland office. Another difficulty was the delay in the formal establishment of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring, which was fortunately overcome with the First Meeting of the Group of Experts, held in San Jose, Costa Rica, 29 August 1989. The report of this meeting was made available to the Session (Document IOCARIBE/GE-MPRM-I/3).

57 Reference was made to the results of the IOC-UNEP Regional Workshop recently held in San Jose, Costa Rica, to review priorities for Marine Pollution Monitoring, Research, Control and Abatement in the Wider Caribbean (Document IOC/UNEP-RRW-I/3). In this respect the Sub-Commission was presented with a set of detailed proposals submitted by the participants of the Workshop (Document IOC/UNEP-RRW-I/8 Add.1) and with the document entitled "State of Marine Pollution and Priorities and Strategies for its control and Abatement in the Wider Caribbean Region" (IOC Workshop Report No. 59 Part II) where an Action Plan prepared by the IOC and UNEP Secretariats based on such proposals is described. It is considered that the establishment of priorities for the suggested programme, falls within the responsibility of the corresponding governing bodies; i.e. this Sub-Commission and the Intergovernmental Meetings of the Caribbean Action Plan to be held in Kingston, Jamaica, 10-18 January 1990. Finally, reference was made to the co-ordination mechanisms of the proposed CEP POL Programme.

58 The Secretary IOC further elaborated on the results of the IOC-UNEP Regional Workshop which was organized by IOC and UNEP on the basis of Recommendation SC-IOCARIBE-II.2, subsequently endorsed by the Fourteenth Session of the IOC Assembly.

59 The main purpose of the Workshop was to formulate a draft of a regionally co-ordinated comprehensive programme for the assessment and control of marine pollution for the Wider Caribbean as a joint IOC-UNEP Programme. The intended coverage of this joint programme is provided in the Workshop Report. In order to facilitate the work, three basic working documents were prepared through the Secretariats, with inputs from regional experts, including the CARIPOL Group of Experts. The proposed joint programme, as presented in the Supplement to IOC Workshop Report No.59 is the result of a long process involving the experts and the secretariats, taking into account also present financial constraints.

- 60 The Secretary IOC noted that the proposed programme built on the experiences made in CARIPOL, including the solid approach as to methods, data delivery, etc. The CARIPOL programme has collected a large regional data base which has been used to provide an assessment of the state of pollution by petroleum hydrocarbons and residues. The information has been brought to the attention the Marine Environment Protection Committee - MEPC of IMO together with information from other regions, and has also been passed on to the regional counterparts, through the IOC collaboration with IMO. Thus, the information could be used for formulating and proposing control and abatement measures.
- 61 In order to try to ensure that the linkage between the assessment parts and the control and abatement parts be made, it is now proposed that this joint, comprehensive regionally co-ordinated programme be adopted. This would ensure a dialogue from the start between producers and users of information. In other regions, experience shows that a scientific advisory body is needed and should be designed to provide the information required for the regulatory commissions and national authorities concerned. Perhaps SC-IOCARIBE could be able to gradually develop such a role. It however requires that the dialogue be firmly established and that the appropriate interaction and communication mechanisms are precisely defined and agreed upon.
- 62 The Sub-Commission, after a detailed study of the proposed Marine Pollution Assessment and Control Programme for the Wider Caribbean Region-CEP POL and the original set of proposals produced by the experts at the IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Research and Monitoring, Control and Abatement in the Wider Caribbean Region, recognized that the proposed funding on the part of IOC and UNEP will be clearly insufficient for full implementation of all of the proposed activities. Consequently, the Sub-Commission requested that the original budget set forth at the Costa Rica Workshop be tabulated and added to the Supplement to IOC Workshop Report No. 59 as further reference. The original proposals will be kept in file by the IOCARIBE Secretariat. The Secretariat will endeavour on a continuous basis to identify additional sources of funding for these projects to increase those funds already identified.
- 63 The Sub-Commission expressed its deep interest in the proposal on the effects of changes of land-use patterns on the Marine Environment. While recognizing UNEP's programmatic decision to include this project in a separate component, the Sub-Commission requested assurance of close linkage of this component with the proposed CEP POL programme.
- 64 The Sub-Commission attributed great importance at the formalization of the network of environmental laboratories, especially with regard to those involved in the analysis of hydrocarbons and pesticides. In this sense, the Sub-Commission recommended that financial contributions from CEP POL to participating institutions include adequate funding for missions of participating scientists to regional laboratories to undertake chemical analysis of environmental samples, when required (Institutional commitments as detailed in items 5.2 and 5.3 of document IOC/UNEP-RRW-I/8, will include specific reference to guarantee such mutual assistance).

65 The Sub-Commission extended its sincere gratitude to Drs Donald Atwood and Alfonso Mata for their enthusiastic and invaluable contributions to the IOCARIBE efforts in the CARIPOL Programme.

66 The Sub-Commission adopted Recommendations SC-IOCARIBE-III.2 and SC-IOCARIBE-III.3.

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

67 Dr. Alejandro Yanez-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) up to now. Likewise, he highlighted the TRODERP theoretical and conceptual framework and the progress obtained during the TRODERP workshops and meetings held in Ciudad del Carmen, Mexico (April 1986); Cartagena, Colombia (May 1987); and Caracas, Venezuela (September 1989).

68 The main results presented relate to the Summary Report of the Workshop to define IOCARIBE/TRODERP Proposals, held in the Universidad 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.

69 The Sub-Commission noted with satisfaction the development of the TRODERP regional initiative and expressed its appreciation to Dr. Yanez-Arancibia for the co-ordination effected and leadership provided.

70 The Sub-Commission thanked the Ministerio de Agricultura y Cria and the Universidad Simon Bolivar, in Venezuela for the excellent facilities made available for the Caracas Workshop.

71 The Sub-Commission 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.

72 The Sub-Commission adopted Recommendation SC-IOCARIBE-III.4.

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

73 Dr. Georges Vernet, IGBA, University of Bordeaux, made the presentation of this item of the Agenda emphasizing the following points:

(1) The regional proposals examined during the two-and-a-half day session on OSNLR of the Course on Knowledge and Management of the Coastal Zone in the Caribbean Region (Document IOC/INF-782) organized by the Institut de Geologie du Bassin d'Aquitaine (IGBA, France) with the support of France (Ministry of Foreign Affairs) and Colombia (Direccion Maritima y Portuaria, DIMAR) and IOC/IOCARIBE held at the CIOH (Cartagena, Colombia, 18 May - 3 June 1988) where experts from eleven countries of the region were

present. Conferences, lectures and case studies of the course were published in a Report entitled "Curso Internacional de Oceanologia costera en la region del Caribe" which is being distributed under request by the "Bibliotheque de l'Institut de Geologie du Bassin d'Aquitaine", 351, Cours de la Liberation, 33405 Talence, France.

(ii) The recommendations and planning developed during the Interdisciplinary Seminar on Research Problems in the Caribbean Region (Document IOCARIBE/ISRP-I/3) held in Caracas, 28 November - 1 December 1989.

74 The Seminar elaborated project components on Impacts of Sea-Level Changes in the Coastal Zone (Item 5.2) in addition to Climate Changes Impacts and Ocean Physical Processes (Item 5.1). Emphasis was given to the need to maintain close links between the two project components since they are considered complementary in many fields (e.g. impact on the coastal zone, establishment of a network of pilot areas studies, calibration of data from remote sensing devices with in-situ data in the coastal zone, etc...).

75 The very short time available to develop item 5.2 only allowed the establishment of some guiding ideas. Thus, in order to advance in a more concrete manner, it was proposed to charge a small Group of Experts with the task of elaborating further a project proposal aimed at studying and surveying coastal processes at a regional level, particularly those related to changes in sea-level.

76 The Delegation of Cuba proposed that this project be discussed and presented during the Second Congress on Ocean Sciences to be held in Havana in June 1990, with support of IOC/IOCARIBE..

77 The Mexican delegation stressed the great implications of erosion problems and requested that local survey on the impact of hurricanes in the coastal zone be included in the general OSNLR Programme. In a similar manner, it requested that studies on sea-grasses be included in those carried out on coral reefs and mangrove areas. It also proposed Puerto Morelos as a pilot area for future studies in this subject.

78 The Secretary of IOC, Dr. Gunnar Kullenberg, presented several aspects of the OSNLR programme and emphasized the importance of the relationship with other programmes and the possibility of obtaining funds if the project proves to be a solid one.

79 The Secretary of IOCARIBE, Dr. Fernando Robles, pointed out that Dr. M. Hendry is reviewing the extent of coastal erosion within the region and is developing an extensive review of the literature associated with the WMO-ICSU-UNEP 20 cm sea-level rise by 2025 AD scenario as part of recommendations made by the UNEP/IOC Task Team on Climatic Changes Impacts and proposed to maintain close co-ordination with this initiative.

80 The Sub-Commission supported the project ideas on OSNLR advanced during the Interdisciplinary Seminar, included in document IOCARIBE/ISRP-I/3.

81 The Sub-Commission underlined again, as it did in Havana (1986), the need to establish co-operation with relevant components of the

COSALC/COMAR project of the Division of Marine Sciences of Unesco.

82 The Sub-Commission re-stated that erosion and sedimentation problems were of high priority in the region and that in relation with the project being proposed, the problem falls within the framework of studies which also include impacts of climatic changes (Item 5.1 of document IOCARIBE/ISRP-I/3).

83 The Sub-Commission noted with satisfaction the general consensus expressed by the different Member States on those matters and stated that the way is now paved for the development of a project addressing these problems in the coastal zone.

84 The Sub-Commission adopted Recommendation SC-IOCARIBE-III.5.

4.5 OCEAN MAPPING AND THE INTERNATIONAL BATHYMETRIC CHART OF
THE CARIBBEAN SEA, AND THE GULF OF MEXICO

85 Mr. Jose Luis Frias, from Mexico, after presenting apologies on behalf of Mr. Nestor Duch Gary, Chairman of the Editorial Board and Chief Editor of IBCCA, for not being able to attend the Session, presented the current state of the Regional IOC Project for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA).

86 He mentioned that prior to the Second Meeting of the Editorial Board, an IBCCA Workshop on Data Sources and Map Compilation was held in Boulder, Colorado, 18-19 July 1988 (IOC Workshop Report No. 55).

87 Mr. Frias stated that during the Session of the Editorial Board it was agreed to use the World Geodesic System (1984) as this system represents a more standardized option. The Board approved a new sheet layout for IBCCA, which is included in Annex III of Document IOC/EB-IBCCA-OFICIALES-I/3, since this adapts better to sheet assembly 1:250,000 of the British Admiralty, as well as to the specifics of regional conditions. Likewise, it helps maintain sheet layout uniformity while reducing the amount of sheets from 21 to 17, without excluding any important geographical characteristic.

88 The Direccion General de Geografia (INEGI) in Mexico has established a bathymetric data system for IBCCA which will enable data exchange, as well as data flow between sheet compilers and the Chief Editor. On the basis of the new sheet layout, the following areas of responsibility were re-assigned: USA, 1-01, 1-02, 1-03, 1-04, 1-09; Mexico, 1-05, 1-06, 1-11; Cuba, 1-07, 1-08; Venezuela, 1-15, and 1-14 up to 73°W; Costa Rica 1-12 and part of 1-13; Colombia 1-17 and remaining parts of 1-14 and 1-13. In this regard, France was requested to consult with the Board's representative in this country, the possibility to complete the compilation of the remaining sheets, (1-10 and 1-16) thereby covering the whole area.

89 Mr. Jose Luis Frias also mentioned that special attention is being given to sheet compilation from 1 to 10, with the aim of publishing this material once the complete block is finished. The World Vector Shoreline Data Base is already available for the IBCCA area; therefore, the coastal line in the coastal zone can be standardized. He expressed the gratitude of the Editorial Board for the NODC-GG of the USA participation and support to

this project. He also mentioned that the Chief Editor is preparing a color proof of IBCCA Sheet 1-09, to be presented during the next Editorial Board Session, scheduled for early 1990.

90 Mr. Frias also informed that the Board hopes to contribute to the updating of the joint IHO-IOC Working Document on "Standardization of Submarine Relief Names", in its English-Spanish version.

91 Finally, he stated that after mapping is concluded, an effort to digitalize bathymetric information will be made, given the importance in the preparation of field digital patterns in the future development of bathymetric charts.

92 The Delegate of Venezuela confirmed that his country was prepared to host the Third Session of the Board in early 1990.

93 The Sub-Commission noted with satisfaction the progress made in the IBCCA project and thanked Mr. Frias for his detailed presentation, asking him to convey these commendations to the Chief Editor.

94 The Sub-Commission also thanked the Delegation of Venezuela for its offer to host the Third Session of the Board in this country.

5. OCEAN SERVICES

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

95 The regional co-ordinator for GLOSS, Dr. George A. Maul (USA), introduced the document on GLOSS Development within IOCARIBE (IOC/GLOSS-I/12) and reviewed efforts to extend the tide-gauge network in the region in support of local and global programmes.

96 He listed the following requested actions: complete establishing the regional sea-level/weather network; encourage participation by IOCARIBE Member States in GLOSS; encourage sending sea-level data to the PSMSL; request IOCARIBE Member States to participate in the IGOSS project ISLPP/NTA (of MEDS, Canada); establish serial oceanographic stations in the Cariaco Basin; increase TEMA support to GLOSS either by sending scientists or engineers to the PSMSL course and/or by having courses within the region; develop a proposal to update the sea-level/weather stations with new generation equipment; and develop a regional absolute sea-level project.

97 The Delegation of Cuba re-stated the offer made during the Fifteenth Session of the IOC Assembly (Paris, July 1989) to host a sea-level training seminar for specialists in 1990, and requested the IOC and the IOCARIBE Secretariats to provide assistance for its organization.

98 The Sub-Commission expressed its appreciation for the regional development in GLOSS, endorsed the actions suggested by the regional co-ordinator, noted with satisfaction that the next meeting of the Group of Experts on GLOSS will be in the IOCARIBE region (Miami, 22-26 October 1990), and encouraged Member States to send an observer to the meeting.

- 99 The Sub-Commission also strongly encouraged the present efforts by the WMO to adopt a flexible coding scheme which could incorporate sea-level data in the GTS network as was proposed at SC-IOCARIBE-I (Curacao, 1984).

5.2 INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

- 100 The Technical Secretary presented an overview of IGOSS, referencing the document Marine Research and Ocean Services: Opportunities for Progress (Document IOC-XV/8 Annex 5). He indicated that developed countries are now the major participants in IGOSS, although many activities benefit from the availability of IGOSS data. The region can take advantage in the near future of monthly products to be made available through the IGOSS Sea-Level Pilot Project for the North and Tropical Atlantic (ISLPP/NTA).

- 101 The Secretary IOC emphasized the urgent need for more ocean observations for major global programmes, noting that IGOSS is the international system in place for collecting, transmitting, and exchanging these data. This need was strongly voiced at the Fifteenth Session of the IOC Assembly. He suggested that IOCARIBE Member States review potential methods of benefiting from IGOSS. He also made reference to the importance of ocean observations and proposed that this problem be analyzed by regional consultants, and the results be circulated among Member States.

- 102 Many delegations stated that the weak interaction existing between IGOSS and IOCARIBE is due to the fact that the countries of the region have not perceived the benefits that could be derived from their participation in this system, by simply providing relevant information which they regularly generate.

- 103 Acknowledging this situation, the delegate of Colombia reiterated the offer made at the Fifteenth Session of the IOC Assembly to host a course on data handling.

5.3 DEVELOPMENT OF THE INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE) SYSTEM TO MEET REGIONAL NEEDS

- 104 The Technical Secretary presented this item giving consideration to documents IOC-XV/8 Annex 5 and IOC/INF-778.

- 105 Emphasis was given to the need to establish national centres for the collection, dissemination and exchange of oceanographic data. This relates to a great extent to communication media and computers facilities which now are becoming available to developing countries.

- 106 The Sub-Commission expressed its satisfaction with the interest shown by some Member States such as Colombia who offered hosting training courses in this field.

107 **The Sub-Commission emphasized** the need to assist developing countries not only in the generation of data but also in the use of the information gathered in the data banks.

5.4 REGIONAL SYSTEMS FOR MARINE INFORMATION MANAGEMENT

108 The Chairman of the Sub-Commission presented this item reviewing the different initiatives on marine information management going on in the region. There are three major types of information to be considered: (i) Bibliography (example: ASFA); (ii) Numerical data bases (example: CARIPOL); and (iii) Reference data bases.

109 An example of the first kind is the ASFA Bibliography (Aquatic Science and Fisheries Abstracts managed by CICH (Centro de Informacion Cientifica y Humanistica) at UNAM (Universidad Nacional Autonoma de Mexico) in Mexico City.

110 The Delegate of Mexico gave a short description of this international, comprehensive data base. It contains bibliographic information on Science, Technology and Management of marine and fresh water environments. ASFA includes citations to 5000 primary journals, monographs, conference proceedings and technical reports. It covers records from 1978 to present and had in January 1989 271,080 records.

111 The CICH has more than 17 years of experience in information management. To collect data to the ASFA data base and distributing it to the region, a minicomputer is used, connected to TELEPAC in Mexico. This results in access to worldwide data base. Great use of electronic mail, both commercial and non-commercial, such as BITNET, SCIENCENET, DIALMAIL, etc., is done.

112 CICH offers to IOCARIBE its experience in bibliographic information, regarding information recovery, selective information, dissemination, creation of microcomputers data bases and assessment in designing information networks and systems. The Center is developing a master degree course on Informatics Studies in Mexico.

113 The Session stressed the importance for every country of the region to have access to this kind of information systems and also the need to incorporate the so-called "grey" literature, i.e. unpublished articles, theses, internal reports, etc. that exist at various institutions in the area.

114 The CARIPOL data base on marine pollution by petroleum hydrocarbons was mentioned as an example of a successful use of a numerical data base.

115 Referring to the Draft IOCARIBE Medium Term Plan 1990-1995 (see Item 7.), the Chairman explained that the Secretariat of IOCARIBE is planning to build up a reference data base containing information not only on different institutions in the region but also on relevant experts and available equipment.

- 116 The UNEP representative strongly urged the use of different electronic mail systems as they have been found to be much more cost effective. He also referred to an article in the latest issue of the newsletter "Cepnews" (vol.3 No. 2) where guidance could be found about electronic networks in the region.
- 117 The Sub-Commission expressed that it would be advisable for each country to have at least one institution (or focal point) with possession of a telefax/telemail equipment.
- 118 The Sub-Commission felt the strong need for stimulating the use of this kind of communication and information facilities in the region.
- 119 The Sub-Commission adopted Recommendation SC-IOCARIBE-III-6.
6. **TRAINING, EDUCATION AND MUTUAL ASSISTANCE (TEMA) ACTIVITIES
IN SUPPORT OF THE SUB-COMMISSION'S PROGRAMMES**
- 6.1 **STRATEGY FOR IMPLEMENTING TEMA AND IDENTIFICATION OF
REGIONAL AND SUB-REGIONAL COMPONENTS OF THE UNESCO-IOC
COMPREHENSIVE PLAN FOR A MAJOR ASSISTANCE PROGRAMME**
- 120 The Secretary IOC, introduced this item making reference to the Document SC-IOCARIBE-III/Inf.2 "IOC-TEMA Medium Term Plan" and the Draft Summary Report of a TEMA Seminar entitled "Partnership in Ocean Sciences and Services for Sustainable Development" (Bremerhaven, 19-22 September 1989), co-sponsored by IOC, Unesco and the Federal Republic of Germany. The Seminar discussed a series of subject areas, including: (a) the role of marine science and services for ocean development and management; (ii) related needs in order to develop and implement marine research; (iii) new forms of partnerships related to marine science development in the framework of the New Law of the Sea; contributions and roles of UN Organizations, National Funding and Donor Agencies to foster international partnership in marine science and services; (iv) mechanisms for the development of marine science and related services; and (v) climatic and global changes.
- 121 The Secretary IOC stressed that it is necessary to change general attitude towards an understanding of the fact that oceans play a crucial role in determining climate variability, a point which was hardly mentioned by delegates for example, even at the Unesco General Conference.
- 122 The Sub-Commission pointed out the importance for Member States to put the ocean and the development of marine science as a priority issue in national and international high level governing bodies. It also stressed the importance for Member States to identify needs of TEMA activities and communicate these needs to the Secretariats of IOC and IOCARIBE in order to establish links with donor agencies.
- 6.2 **SUPPORT TO REGIONAL RESEARCH AND SERVICES PROGRAMMES**
- 123 It was stressed that the countries in the region often do not have maritime tradition and therefore are unwilling to make national commitments within the TEMA fields.

- 124 The Delegation of the USA described the activities and facilities of the Department of Marine Sciences of the University of Puerto Rico at Mayagüez. It was explained that TEMA-related opportunities within the four major field of oceanography (physical, geological, chemical and biological) could be made available to the IOCARIBE region. Specific TEMA opportunities mentioned are:
- (i) **Graduate Student Programme:** Studies leading to the MSc and/or PhD degrees are opened to qualified applicants; instruction is in Spanish and English but a working knowledge of English is necessary; assistantships are available on conditions of availability and qualification; assistantships are not available during the first academic semester of study.
 - (ii) **Training Course and Workshops:** Such activities can be arranged and convened (as long as there is no cost to the University). Simple dormitory facilities are available at no cost to participants.
 - (iii) **Technician Training:** Qualified technical personnel can receive training within the Department of Marine Sciences for suitably long periods of time. The technician's home country must bear all transportation and daily subsistence costs.
 - (iv) **Career Development:** Established scientists and professors on leave or on special mission are accepted for advanced or re-orientation studies; such visits should be arranged in advance with individual professors in the Department; bilateral research is encouraged; under certain circumstances, the University can supplement the visiting scientist's salary with social fellowship funds.
- 125 The Delegation of Cuba offered place for regional oceanographers and technicians on 45 days cruises onboard the research vessel "Ulises". All costs during the cruises will be covered by Cuba. Courses in Ecology, Fishery and Aquaculture were also offered.
- 126 A working group was formed to consider the need to formulate recommendations on TEMA activities. Their conclusion, however, was that no recommendations should be done in this report but instead be expressed in the Medium- Term Plan.
- 127 **The Sub-Commission** agreed that many training opportunities exist at different institutions in the region. However, the availability of funds hampered the possibilities for many scientists to make use of these offers.
- 128 **The Sub-Commission** stressed the importance of the TEMA programme and the need to further strengthen training, education and mutual assistance in the region. It agreed that TEMA components should be included in any project developed for implementation in the IOCARIBE region. The TEMA components should be considered as an integrate part of all IOCARIBE activities and not as a separate programme.

7. IOCARIBE MEDIUM-TERM PLAN (1990-1995)

129 Dr. Manuel Murillo introduced the item and presented the results of a working group which during the Session revised the Draft IOCARIBE Medium Term Plan (1990-1995) (Document SC-IOCARIBE-III/8 rev.2) elaborated by the IOCARIBE Secretariat and presented a Second Draft IOCARIBE Medium Term Plan (1990-1995) which was reviewed by the Delegates.

130 The Sub-Commission decided that the final editing should be done by the IOCARIBE Secretariat and that a revised version should be circulated to Member States in early January 1990. In order to present the revised document to the Twenty-third Session of the IOC Executive Council in March 1990, it is imperative that observations from Member States should be received by the IOCARIBE Secretariat not later than 1 February 1990. Due to the very limited timeframe, the Secretariat proposed that Member States immediately circulate the early two draft versions among national institutions and scientists concerned. In that way the IOCARIBE Secretariat would be in a better position to timely incorporate relevant observations.

131 The Sub-Commission provided the IOCARIBE Secretariat with guidance regarding the editing and additional inputs to the Final Draft of the Medium-Term Plan and stressed the importance of this document as a first step towards an increased execution and decision making capacity of the Sub-Commission.

8. CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES

8.1 UNEP REGIONAL SEAS ACTION PLAN FOR THE CARIBBEAN ENVIRONMENT PROGRAMME

132 Mr. Anders Alm, IOC Consultant, introduced this item making reference to the close co-operation with the Caribbean Environment Programme through its Regional Co-ordinating Unit in Kingston, Jamaica. To assure a continuous co-ordination between IOC/IOCARIBE and UNEP, an outposted IOC staff member have since 1987 been working at the RCU for the Caribbean Environment Programme.

133 During the last years, a closer co-operation between IOC and UNEP has been developed and IOC became responsible for the technical co-ordination of all projects within the Caribbean Environment Programme, related to Marine Pollution Assessment and Control. At the Joint IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Monitoring, Research, Control and Abatement in the Wider Caribbean held in San Jose, Costa Rica, 24-30 August 1989, a regionally co-ordinated Marine Pollution Assessment and Control Programme in the Wider Caribbean - CEP POL was developed.

134 Also in the fields of Ocean Processes and Climate, Impacts of Climatic Changes and TEMA activities, co-operation between IOC/IOCARIBE and RCU/CEP has increased and should be further strengthened together with the co-ordination.

135 **The Sub-Commission expressed its satisfaction regarding the regional co-operation with UNEP and stressed the importance to further develop these beneficial efforts.**

8.2 **UNESCO MAJOR INTERREGIONAL PROJECT ON RESEARCH AND TRAINING LEADING TO INTEGRATED MANAGEMENT OF COASTAL SYSTEMS (COMAR)**

136 **The Technical Secretary presented this item referring to information provided by the Unesco Division of Marine Sciences regarding the implementation of the COMAR/COSALC project in the Caribbean region.**

137 **Within the Sub-Project COSALC I (of COMAR) dealing with coastal and beach stability in the Eastern Caribbean islands, three coastal monitoring programmes and field manuals have been prepared for Dominica, St Kitts and Nevis during the period 1987-1988. The programmes are essentially designated to monitor the beach profiles in various sites around the islands and to measure waves periods and directions. Audio-visual material was provided to six participating countries in 1987 (Antigua, Dominica, Grenada, St Kitts, St Lucia and St Vincent).**

138 **Within the Sub-Project COSALC III (Caribbean Coastal Marine Productivity - CARICOMP) a meeting of the CARICOMP Steering Committee was held at the UNAM Marine Research Station, Puerto Morelos, Mexico, 23-26 February 1988; a revision of the CARICOMP Programme was discussed and has been finalized; a Regional Training Workshop on the basis of a Manual of Research Methods is being organized in 1990 with financial support from Unesco; and, a list of research titles concerning the Caribbean region which is considered complete for the sections on mangroves and sea-grass but not as yet for coral reefs, has been produced.**

139 **The Sub-Commission noted with interest the ongoing activities on the COMAR/COSALC Project.**

140 **The Sub-Commission re-stated the need to co-ordinate this project with relevant components of IOCARIBE Programmes, particularly OSNLR.**

141 **The Sub-Commission adopted Recommendation SC-IOCARIBE-III.7.**

8.3 **OTHER REGIONAL PROGRAMMES**

142 **The Sub-Commission expressed the strong need for continued linking and co-operation with governmental and non-governmental organizations relevant to IOCARIBE activities. The Sub-Commission instructed the IOCARIBE Secretariat to take action in this matter.**

9. **ELECTION OF OFFICERS**

143 **An Election Committee lead by Dr Jorge Carranza from Mexico, also composed by Barbados, Colombia and Jamaica, performed during the Session consultations with all delegations attending. The Committee proposed Dr Hernán Pérez-Nieto from Venezuela as new Chairman of the Sub-Commission.**

144 The Committee also proposed that the number of Vice-Chairmen be
increased to two, so as to distribute in a better fashion the officers
responsabilities within the Sub-Commission.

145 Dr. George Maul from USA and Dr Guillermo Garcia from Cuba were
suggested for these two positions.

146 The Sub-Commission unanimously approved these proposals and Dr.
Hernán Pérez-Nieto and Drs. George Maul and Guillermo García were, with
acclamation, elected Chairman and Vice-Chairmen, respectively, for the next
intersessional period and the next Session of the Sub-Commission.

10. **DATES AND PLACE FOR THE FOURTH SESSION OF THE SUB-
COMMISSION**

147 It was noted that the Sub-Commission should meet every two years
immediately previous to the IOC Assembly. In order to re-establish this
schedule, the Sub-Commission proposed that the Fourth Session be held by
early Autum 1992. The Sub-Commission also stressed the importance that
IOCARIBE matters should be always included as an agenda item for the IOC
Assembly.

148 The Delegation of Mexico offered to host the Fourth Session of the
Sub-Commission, probably in Mexico City.

149 The Sub-Commission expressed its gratitude to Mexico for this
generous offer.

150 The Sub-Commission adopted recommendation SC-IOCARIBE-III.8.

11. **ADOPTION OF THE SUMMARY REPORT AND RECOMMENDATIONS**

151 The Sub-Commission adopted the Summary Report and Recommendations
from the Third Session.

12. **CLOSURE**

152 In closing the Session, the Chairman thanked the Government of
Venezuela, on behalf of the delegations, for the excellent facilities made
available for this meeting as well as for the Interdisciplinary Seminar on
Research Problems in the IOCARIBE Region held during the previous week. He
emphasized in particular the support provided by the Ministry of Foreign
Affairs of Venezuela through the IOC Focal Point Mrs. Myriam Prado. He also
expressed his personal satisfaction at the end of his term as Chairman, for
the work accomplished during the two intersessional periods in a very close
collaboration and working practices with the IOCARIBE Secretariat in
Cartagena, Colombia.

- 153 **The Sub-Commission commended** the dedicated work of the Chairman, Captain Oceanographer Rafael Steer Ruiz, and the Vice-Chairman Dr. Barry Wade, in successfully guiding the Sub-Commission's activities during a period where many difficulties had to be overcome.
- 154 **The Sub-Commission also honoured** with a gift and a standing ovation to Dr. Harry B. Stewart as recognition for his twenty five years of continuous dedication and service to CICAR and IOCARIBE.
- 155 **The Session was closed** at 17:00, Friday 8 December 1989.

ANNEX I

AGENDA

- 1. OPENING**
- 2. ADMINISTRATIVE ARRANGEMENTS**
 - 2.1 Adoption of the Agenda
 - 2.2 Designation of Rapporteurs for the Session
 - 2.3 Conduct of the Session, timetable and documentation
- 3. REPORT ON INTERSESSIONAL ACTIVITIES**
- 4. OCEAN SCIENCES**
 - 4.1 Physical oceanography and climate
 - 4.2 Marine pollution research and monitoring - Regional component of GIPME-MARPOLMON
 - 4.3 Regional component of the IOC-FAO Programme on Ocean Science in Relation to Living resources (OSLR)
 - 4.4 Regional component of the IOC-UN(OALOS) Programme on Ocean Science in Relation to Non-Living Resources (OSNLR)
 - 4.5 Ocean mapping and the International Bathymetric Chart of the Caribbean Sea, Gulf of Mexico and part of the Pacific Ocean off Central America
- 5. OCEAN SERVICES**
 - 5.1 Regional component of the Global Sea-Level Observing System (GLOSS)
 - 5.2 Regional component of the IOC-WMO Integrated Global Ocean Services System (IGOSS)
 - 5.3 Development of the International Oceanographic Data and Information Exchange (IODE) system to meet regional needs
 - 5.4 Regional systems for marine information management

6. TRAINING, EDUCATION AND MUTUAL ASSISTANCE (TEMA) ACTIVITIES IN SUPPORT OF THE SUB-COMMISSION'S PROGRAMMES

6.1 Strategy for implementing TEMA and identification of regional and sub-regional components of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme

6.2 Support to regional research and services programmes

7. IOCARIBE MEDIUM-TERM PLAN (1990-1995)

8. CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES

8.1 UNEP Regional Seas Action Plan for the Caribbean Environment Programme

8.2 Unesco major interregional project on research and training leading to integrated management of coastal systems (COMAR)

8.3 Other regional programmes

9. ELECTION OF OFFICERS

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

11. ADOPTION OF THE SUMMARY REPORT AND RECOMMENDATIONS

12. CLOSURE

ANNEX II

RECOMMENDATIONS

Recommendation SC-IOCARIBE-III.1

PHYSICAL OCEANOGRAPHY AND CLIMATE

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

Recognizing

- (i) the considerable progress made in developing the IOCARIBE Programme on Physical Oceanography and Climate;
- (ii) the other IOCARIBE programmes, such as CEP POL, OSLR, OSNLR, etc. which could be enhanced by an increased knowledge of Ocean Physical Processes;
- (iii) the necessity of in-situ data to validate remote sensing measurements specially in in-shore areas;
- (iv) the general concern expressed by delegations regarding the magnitude, direction and possible impacts of climatic and other environmental changes;
- (v) the importance of a better understanding of basin scale ocean circulation in the Caribbean Sea and Adjacent Regions in order to predict and forecast climatic changes both at the regional and global level;

Supports the conclusions from the Interdisciplinary Seminar on Research Problems in the IOCARIBE Region, Caracas, Venezuela, 28 November - 1 December 1989;

Recommends that the project proposal developed during the Seminar, entitled "Climate Change Impacts and Ocean Physical Processes", should be implemented in the region;

Requests the Secretariats of IOC and IOCARIBE:

- (i) to transmit this project proposal to Unesco and UNEP with a request for funding assistance to permit full and rapid implementation;
- (ii) to consolidate the approved IOCARIBE Group of Experts in Physical Oceanography and Climate to co-ordinate this project with other relevant activities such as WOCE, GLOSS, JGOFS and TOGA and also with those studies carried out by UNEP and other relevant international organizations,

Urges IOCARIBE Member States to give these activities strong support and participation

Recommendation SC-IOCARIBE-III.2

**MARINE POLLUTION RESEARCH AND MONITORING
REGIONAL COMPONENT OF GIPME-MARPOLMON**

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

Recognizing

- (i) the successful implementation of the CARIPOL Petroleum Monitoring Programme and the efforts of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring,
- (ii) the efforts and benefits to develop a Joint IOC-UNEP Marine Pollution Assessment and Control Programme for the Wider Caribbean Region - CEP POL,
- (iii) the results of the IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Monitoring Research, Control and Abatement in the Wider Caribbean, San Jose, Costa Rica, 24-30 August 1989,

Taking note of the valuable information which can be made available to CEP POL, in particular regarding dispersion and transport of pollutants from the IOCARIBE Project on Climate Change Impacts and Ocean Physical Processes,

Endorses in principle the Report of the IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Monitoring, Research, Control and Abatement in the Wider Caribbean and the proposed Joint IOC-UNEP Marine Pollution Assessment and Control Programme for the Wider Caribbean - CEP POL;

Recommends

- (i) to the IOC and IOCARIBE Secretariats to further develop in consultation with UNEP the details for the co-ordination of the CEP POL programme;
- (ii) to the IOCARIBE Secretariat to take the necessary steps for the orderly transition of its CARIPOL Programme to constitute an integrated part of the CEP POL Programme;
- (iii) that those institutions participating in CEP POL should establish and formalize a regional network;
- (iv) that, when the Joint IOC-UNEP Group of Experts for CEP POL be established, it shall include, inter alia, the members of the IOCARIBE Group of Experts on Marine Pollution Research and Monitoring which shall then cease to exist;

Requests the IOC and IOCARIBE to make strong efforts to obtain additional funds for CEP POL;

Urges all IOCARIBE Member States to give full support to the activities for assessment and control of marine pollution in the Caribbean within CEP POL.

Recommendation SC-IOCARIBE-III.3

**Dr. ATWOOD's INVOLVEMENT IN CICAR, IOCARIBE ASSOCIATION
AND IOCARIBE SUB-COMMISSION**

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

Noting that Dr. Donald K. Atwood (USA) is unable to continue his involvement in IOCARIBE after more than 15 years of dedicated participation in IOCARIBE and its predecessor, CICAR,

Recognizing his many significant contributions including inter alia:

- (i) 1973 appointed CICAR subject leader for Chemical Oceanography, authored the Manual for Standard CICAR Chemical Stations, and participated in the Cartagena CICAR meeting and all subsequent ones.
- (ii) 1974 developed intercalibration exercise, CINTEX-I.
- (iii) 1975 obtained funding for, organized and conducted CINTEX-II at University of Costa Rica.
- (iv) 1976 Member of the Organizing Committee for CICAR-II Symposium in Caracas.
- (v) 1976 organized Mayaguez meeting to develop IOCARIBE Chemical Oceanography Programme.
- (vi) 1976 chaired Chemical Oceanography Session at CICAR-II Symposium.
- (vii) 1976 presented Caribbean Chemical Oceanography overview paper at IOC/FAO/UNEP Workshop on Marine Pollution in the Caribbean at Port of Spain.
- (viii) 1978 reported on Port of Spain Workshop to IOC/GIPME Committee in Bergen, Norway.
- (ix) 1978 at IOCARIBE meeting in San Jose, he presented plan for Marine Pollution Research and Monitoring which became CARIPOL;

Since then, in co-operation with the IOCARIBE Secretary, Dr Atwood has been "Mr. CARIPOL". He organized and conducted training workshops on CARIPOL procedures in Spanish and English, developed CARIPOL Manuals in two languages, helped secure spectrofluorometers for Costa Rica, Jamaica and Cuba and organized and chaired CARIPOL Steering Committee meetings. He secured a ship for and was Chief Scientist on the 1980 intercalibration exercise off Bermuda. He helped establish the CARIPOL data archival procedures allowing entry of data at his NOAA/AOML laboratory and transfer to NODC. He organized and chaired the symposium on CARIPOL results at Mayaguez, P.R. in 1985 which resulted in a dedicated volume of the Caribbean Journal of Science (Vol. 23, No. 11, May 1987). He continued in CARIPOL activities, participating in meetings and workshops, and publishing papers

on CARIPOL results. In 1988 he revised the English and Spanish CARIPOL Manuals based on the experience of the programme to that date and passed them to the new CARIPOL Chairman;

Extends to Dr. Atwood its sincere gratitude for his talented and enthusiastic professional leadership in the chemical oceanography and marine pollution programmes of CICAR and IOCARIBE; and

Requests the Secretary to convey a copy of this recommendation to Dr. Atwood, to the Director of NOAA/AOML in Miami, to the Administrator of NOAA in Washington, D.C., and to the Chairman and Secretary of the IOC.

Recommendation SC-IOCARIBE-III.4

REGIONAL COMPONENT OF THE IOC-FAO PROGRAMME ON OCEAN SCIENCE 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 implementation of the TRODERP initiative in the IOCARIBE Region, the proposals and recommendations made by the Workshop to define IOCARIBE- TRODERP proposals, in particular,

Emphasizing the comprehensive nature of the multidisciplinary research on the ecosystems selected for the study of fishing resources, and recruitment in this tropical demersal species;

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

Endorses the proposals and recommendations of the workshop to define IOCARIBE-TRODERP proposals,

Instructs the IOCARIBE Secretary to develop an adequate strategy so that TEMA components be considered in methodological and intercalibration training courses pertaining to recruitment studies carried out through the SOAR, FEDERP, PREP and CORDERP sub-projects;

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

Requests further IOCARIBE Member States, that results of national technical committees be informed to the IOCARIBE Secretariat so as to be conveyed to the IOCARIBE Group of Experts on TRODERP and the SOAR, FEDERP, PREP and CORDERP Co-ordinators;

Recommends to IOC that the TRODERP/IOCARIBE Project be supported in all aspects required for its implementation and suggests that the TRODERP Group of Experts and Sub-project Co-ordinators with the assistance of the IOCARIBE Secretariat, develop the four sub-projects as soon as possible in order to submit them to potential funding agencies.

Recommendation SC-IOCARIBE-III.5

**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),

Considering the discussions that have taken place at the first two SC-IOCARIBE Sessions (Curacao, 1984; Havana, 1986) on the need to undertake regional research within the IOC/UN (OALOS) Programme on Ocean Science in Relation to Non-Living Resources (OSNLR),

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

Noting further that there are several programmes on beach and coastal dynamics being planned or in progress within the IOCARIBE Region, including in part those of COMAR/COSALC, UNEP-CEP, ECLAC as well as several national efforts,

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

Taking into account the recommendations expressed during the Havana Mini-Symposium (1986), which were adopted during SC- IOCARIBE II (1986), the course given in Cartagena (1988) and the Third Session of the Guiding Group of Experts on OSNLR held in Bordeaux (1989),

Recalling the Recommendations adopted by the Second Session of the IOCARIBE Sub-Commission,

Endorses the proposal on Impacts of Sea-Level changes on the Coastal Zone- Effects on Erosion and Sedimentation developed during the Interdisciplinary Seminar on Research Problems in the Caribbean Region; and,

Recommends, specifically, that the IOCARIBE Secretariat:

- (i) Establish an ad-hoc Group of Experts entrusted with further elaboration of a project which facilitates the survey of coastal processes at a regional level and its relationship to local sea-level changes and erosion and sedimentation problems;
- (ii) Take the necessary steps so that Support for these experts be provided to gather the information required to establish a diagnosis which will serve as basis for the final drafting of the project in time to be discussed in HAVANA in June 1990, during the Second Congress on Ocean Sciences, and corresponding follow up;
- (iii) Take appropriate measures in conjunction with the ad-hoc Group of Experts that lead to improved interaction, co- operation and where possible, consolidation of the existing or planned beach and coastal dynamic programmes, noted above, including efforts needed to support local surveys on impact of hurricanes, and on

sea-grasses studies related to coral reefs and mangrove areas,

- (iv) Support all activities of the regional OSNLR programme with strong Training, Education and Mutual assistance (TEMA) elements.

Recommendation SC-IOCARIBE-III.6

REGIONAL SYSTEM FOR MARINE INFORMATION MANAGEMENT

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

Noting the crucial importance of developing and co-ordinating Marine Information Systems in the Region,

Recommends that IOCARIBE actively seeks, through consultations with Member States the identification of at least two institutions to guide access to information in each country. These could be: (a) an academic institution; (b) a governmental institution;

Recommends further that each Member State formally register in the IOCARIBE Secretariat these national centers;

Requests that IOC and IOCARIBE provide training facilities for human resources in the region to become orienters in each country in this field;

Requests further that IOCARIBE proceeds to carry out an inventory of regional data bases and information systems in the region and prepares a methodology for their utilization;

Suggests that IOC/IOCARIBE strengthen their "focal points/ institutions", so as to be provided with a minimum amount of equipment to improve operation and services in this field;

Suggests further that Mexico, through the UNAM's "Centro de Información Científica Humanística (CICH)", provides a manual on relevant information for the use of IOCARIBE Member States.

Recommendation SC-IOCARIBE-III.7

**UNESCO MAJOR INTERREGIONAL PROJECT ON RESEARCH AND TRAINING
LEADING TO INTEGRATED MANAGEMENT OF COASTAL SYSTEMS (COMAR)**

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

Recalling Recommendation SC-IOCARIBE-II.8 on co-operation between IOCARIBE and the Unesco Division of Marine Sciences in COMAR,

Taking into account that the Division of Marine Sciences of Unesco and IOCARIBE are developing projects which are similar in nature and objectives in areas of common interest,

Taking into account further that in order to better implement and develop these projects and actions, and make proper use of human and financial

resources, a closer interaction and co-operation between IOCARIBE and COMAR/COSALC is logical and necessary,

Recommends IOC to establish proper working links between the COMAR/COSALC Project of the Division of Marine Sciences and activities developed by IOC/TEMA in the region;

Recommends further that the IOC Secretariat informs the Division of Marine Sciences that IOCARIBE is willing to play a co-ordination role in implementing projects in marine sciences which the Division may develop or plan for the region;

Requests the Chairman, Vice-Chairmen and the IOC Senior Assistant Secretary for IOCARIBE to make all possible efforts to establish appropriate co-ordination links regarding Ocean Sciences programmes and services in the Region.

Recommendation SC-IOCARIBE-III.8

SCHEDULING OF SESSIONS OF THE IOCARIBE SUB-COMMISSION

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

Recognizing that the time period between SC-IOCARIBE-II and SC-IOCARIBE-III in fact was three years;

Further recognizing the necessity of close co-ordination among Member States who actively participate in IOCARIBE activities,

Recommends that:

- (i) The Sub-Commission meet every two years instead of every three years, following the next Session in 1992;
- (ii) A meeting be held annually in conjunction with the IOC Executive Council to review IOCARIBE intersessional activities, which would be open to all IOCARIBE and other Member States present;
- (iii) The officers and Secretariat meet at least once during the intersessional period at the IOCARIBE Secretariat to assess progress, foster an exchange of information, and improve co-ordination with National Focal Points;
- (iv) IOCARIBE matters should always be on the Agenda for the IOC Assembly.

ANNEX III

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ANNEX IV/ANEXO IV

**LIST OF ACRONYMS AND ABBREVIATIONS/
LISTA DE ACRONIMOS Y ABREVIATURAS**

AOML	Atlantic Oceanographic and Meteorological Laboratory
ASFA	Aquatic Sciences and Fisheries Abstracts
ASFIS	Aquatic Science and Fisheries Information System Sistema de Información sobre Ciencias Acuáticas y Pesca
CARICOMP	Caribbean Coastal Marine Productivity
CARIPOL	Caribbean Pollution Monitoring Programme (IOCARIBE)
CEP	Caribbean Environment Programme (UNEP)
CEP POL	Marine Pollution Assessment and Control Programme for the Wider Caribbean (IOC/IOCARIBE - UNEP/RCU)
CICAR	Co-operative Investigations of the Caribbean and Adjacent Regions
CICH	Centro de Información Científica y Humanista
CINTEX	CICAR Intercalibration Experiment
CIOH	Centro de Investigaciones Oceanográficas e Hidrográficas
COI	Comisión Oceanográfica Intergubernamental
COMAR	Unesco Major Interregional Project on Research and Training
CONICIT	Consejo Nacional de Investigaciones Científicas y Tecnológicas
CORDERP	TRODERP Sub-Project on Coral-Reef Demersal Recruitment
COSALC	Coastal System of Latin America and the Caribbean
DDPH's	Dissolved and Dispersed Petroleum Hydrocarbons
DIMAR	Dirección Marítima y Portuaria
ERS	European Resource Satellite
ESA	European Space Agency

FAO	Food and Agriculture Organization of the United Nations Organización de las Naciones Unidas para la Agricultura y la Alimentación
FEDERP	TRODERP Sub-Project on Fish-Estuarine Deltaic Recruitment
GIPME	Global Investigation of Pollution in the Marine Environment Investigación Mundial de la Contaminación en el Medio Marino
GLOBEC	Global Ocean Ecosystems Dynamics
GLOSS	Global Sea-Level Observing System
GTS	Global Telecommunications System
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico Carta Batimétrica Internacional del Mar Caribe y Golfo de México
IGOSS	Integrated Global Ocean Services System
IHO	International Hydrographic Organization
IMO	International Maritime Organization
INEGI	Dirección General de Geografía (México)
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions Subcomisión de la COI para el Caribe y Regiones Adyacentes
IODE	International Oceanographic Data and Information Exchange System
IREP	International Recruitment Experiment
ISLPP/NTA	IGOSS Sea-Level Pilot Project for the North and Tropical Atlantic
ISRP	Interdisciplinary Seminar on Research Problems in the IOCARIBE Region
JGOFS	Joint Global Ocean Flux Study
MARPOLMON	Marine Pollution Monitoring Programme (IOC) Programa de Vigilancia de la Contaminación Marina (COI)

MEDS	Marine Environment Data Service
MEPC	Marine Environment Protection Committee
MPRM	Marine Pollution Research and Monitoring
NOAA	National Oceanic and Atmospheric Administration
NU (UN)	Naciones Unidas
OALOS	Office of Ocean Affairs and the Law of the Sea (UN)
OMM (WMO)	Organización Meteorológica Mundial
OSLR (IOC/FAO)	Ocean Science in Relation to Living Resources
OSNLR (IOC/UN (OALOS))	Ocean Science in Relation to Non-Living Resources
PNUD (UNDP)	Programa de las Naciones Unidas para el Desarrollo
PNUMA (UNEP)	Programa de las Naciones Unidas para el Medio Ambiente
PREP	TRODERP Sub-Project on Penaeids Recruitment
PSMSL	Permanent Service for Mean Sea-Level
RCU/CEP	Regional Co-ordination Unit for CEP (UNEP)
SC-IOCARIBE	Sub-Commission IOCARIBE
TEMA	Training, Education and Mutual Assistance in the Marine Sciences (IOC) Capacitación, Educación y Asistencia Mutua en Ciencias del Mar (COI)
TOGA	Tropical Ocean and Global Atmosphere (WMO/IOC)
TRODERP	Tropical Demersal Recruitment Project
UN	United Nations
UNAM	Universidad Nacional Autónoma de México
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
WATS	Western Atlantic Turtle Symposium
WMO	World Meteorological Organization