

**Intergovernmental Oceanographic Commission**  
*Reports of Governing and Major Subsidiary Bodies*



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

## **Second Session**

Havana, Cuba, 8-13 December 1986

**In this Series**

**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:

- Eleventh Session of the Working Committee on International Oceanographic Data Exchange
- Seventeenth Session of the Executive Council
- Fourth Session of the Working Committee for Training, Education and Mutual Assistance
- Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment
- First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions
- Third Session of the *ad hoc* Task Team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime
- First Session of the Programme Group on Ocean Processes and Climate
- Eighteenth Session of the Executive Council
- Thirteenth Session of the Assembly
- Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific
- Nineteenth Session of the Executive Council
- Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment
- Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange

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## 1. OPENING

The Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions was called to order by Capitán Rafael Steer Ruiz, Chairman of the Sub-Commission, at 10.00 a.m. on 8 December 1986, in the International Conference Center, Hayana, Cuba.

Dr. Carlos Gómez, Vice President of the Academy of Sciences of Cuba, then addressed the Sub-Commission. He presented an overview of recent developments in ocean science in his country and stressed Cuba's active participation in the Intergovernmental Oceanographic Commission and other similar agencies of the United Nations. He noted that the founding in July 1983, of the Cuban National Oceanographic Committee, "an agency for consultancy, advice and co-ordination of ocean sciences activities in the country," was an extremely important event in Cuba-IOC relations. In the regional context, he noted Cuba's participation in CICAR activities, including hosting its 1972 meeting, and later in the then Association and now IOCARIBE Sub-Commission.

The Chairman of the Sub-Commission warmly thanked Dr. Gomez for his words of welcome and for the excellent facilities provided by the host country for this IOCARIBE meeting. He noted that the presence in the opening session of Dr. Vicentina Antuña, President of the Cuban National Commission for Unesco; Ada Pentón, Representative of the Unesco Regional Office for Culture in Latin America and the Caribbean; and Guillermo Garcia, President of the Cuban National Oceanographic Committee and Local Co-ordinator of the event.

The IOC Senior Assistant Secretary for IOCARIBE and Technical Secretary of the Session, Dr. Fernando Robles, transmitted the greetings of Dr. Mario Ruivo, Secretary of the IOC, to the participants, and his thanks, on behalf of the Commission, to the Government of Cuba for hosting the Second Session of IOCARIBE. He explained that Dr. Ruivo was prevented from attending the session personally, as originally expected, owing to urgent last-minute developments.

The List of Participants is given in Annex III.

A List of Acronyms and Abbreviations is given in Annex V.

## 2. ADMINISTRATIVE ARRANGEMENTS

### 2.1 ADOPTION OF THE AGENDA

The President submitted the Provisional Agenda (Document SC-IOCARIBE-II/1 prov.) for approval by the Sub-Commission; it was adopted after the addition of Item 9. The subsequent items were thus renumbered 10 to 13. The amended Agenda as adopted is given in Annex I.

### 2.2 DESIGNATION OF RAPORTEURS FOR THE SESSION

The Chairman explained that translation services into English were available and suggested the designation of a Spanish-language Rapporteur only. He proposed the nomination of Lic. Alfredo Ramos of the Cuban Delegation. Both proposals were accepted by the Sub-Commission.

### 2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

The Technical Secretary of the Session provided the Sub-Commission with some information on administrative arrangements regarding the conduct of the Session and social

and cultural activities kindly offered by the host country. He proposed a provisional timetable of activities, which was adopted by the Sub-Commission, and referred in detail to the Revised Provisional List of Documents (Doc. IOCARIBE-II/4 Prov. Rev. 1). He explained that the listed documents had been prepared jointly by the IOC Secretariat in Paris and the IOC Secretariat for IOCARIBE in Cartagena and he thanked the Centro de Investigaciones Oceanográficas (CIOH) of Cartagena for the facilities provided in view of the temporary lack of a permanent headquarters for the IOC Secretariat for IOCARIBE.

### 3. REPORT ON INTERSESSIONAL ACTIVITIES

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On behalf of the IOCARIBE Chair and Secretariat, the Chairman presented document SC-IOCARIBE-II/Inf.2 – Intersessional Session held in Curaçao, Netherlands Antilles, on August 1984, the Sub-Commission had conducted its activities in a period that could be described as transitional, and he went on to outline the various activities undertaken in the intersessional period. The following ocean science activities were highlighted:

(i) *Ocean Processes and Climate*

A workshop on Physical Oceanography and Climate was held in Cartagena, Colombia (17-22 August 1986), the main outcome of which was a proposal for an IOCARIBE Programme in Sea-Level/Weather Monitoring of the Caribbean Sea and Adjacent Regions (CSAR).

(ii) *Marine Pollution Research and Monitoring*

Two major events, among others, were organized as part of the CARIPOL Programme (which has become one of the Sub-Commission's most successful activities): the IOC/UNEP Symposium on the Review of Petroleum Hydrocarbons in the Caribbean (Mayagüez, Puerto Rico, 1-6 December 1985); and an IOC/UNEP Training Workshop on Analysis of Petroleum Hydrocarbons in Sediments and Biota (Puerto Morelos, Mexico, 10-22 November 1986). In addition, a Swedish Associate Expert was outposted to the IOC Secretariat for IOCARIBE in February 1986 to follow up this important regional programme. Following a preliminary agreement with UNEP, IOCARIBE will also shortly receive an IOC staff member outposted to the UNEP Regional Co-ordination Unit in Jamaica, supported by UNEP.

(iii) *Ocean Science in relation to Living Resources (OSLR)*

A workshop on Recruitment in Tropical Coastal Demersal Communities (TRODERP) was organized by IOC and FAO in Ciudad del Carmen, Campeche (21-25 April 1986) hosted by the Universidad Nacional Autónoma de México (UNAM) and the Secretaría de Pesca de México. The Workshop, which was attended by specialists in demersal communities in various tropical coastal systems, made four proposals for major regional and interregional projects.

Another important component of the OSLR Programme in the region concerns the organization of the Second Western Atlantic Turtle Symposium (WAIS-II) to be held from 12 to 16 October 1987 in Mayaguez, Puerto Rico.

(iv) *Ocean Science in relation to Non-Living Resources (OSNLR)*

The Chairman of the Guiding Group of Experts on OSNLR carried out two missions in the IOCARIBE region (November 1985 and February 1986). An IOCARIBE Mini-Symposium for the regional development of the IOC-UN(OETB) Programme was held on «Ocean Science in relation to Non-Living Resources», prior to the Second Session of the Sub-Commission. It made three project proposals concerning the coastal zone and two proposals for palaeo-oceanographic and tectonic studies, supported by various offers for regional training. Negotiations are well ad-

vanced with France to outpost a French marine geologist as an Associate Expert to the IOC Secretariat for the Sub-Commission from 1978 to follow up the regional components of OSNLR.

(v) *Ocean Mapping*

The First Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean of Central America (IBCCA) was held in Aguascalientes, Mexico (19 September - 2 October 1986). Among other actions taken, the Board appointed the Chairman and Chief Editor of IBCCA, adopted the Board's Terms of Reference, identified potential national participation in the Project and designed a plotting sheet diagram with the relevant specifications.

With respect to ocean services, regional needs in the Integrated Global Ocean Services System (IGOSS) and the Global Sea-Level Observing System (GLOSS) are basically determined by two mutually supportive sets of requirements: (i) the proposed IOCARIBE Programme in Sea-Level/Weather Monitoring and (ii) the co-ordination of regional activities with the oceanographic components of the World Climate Research Programme (WCRP), including its TOGA, WOCE and OOSDP projects. Concerning the International Oceanographic Data Exchange System (IODE), the Group of Experts on National Oceanographic Data Centres especially recommended IOCARIBE to enquire about the real volume of data exchanged by the countries in the region through the Responsible National Oceanographic Data Centre for IOCARIBE (NOGC, Washington D.C.). In the area of marine information management, two initiatives have been negotiated during the intersessional period: the first aimed at establishing a regional mechanism for information exchange in marine sciences in the IOC Secretariat for IOCARIBE; the second, a subregional activity, at meeting the data management and marine information needs of the Eastern-Caribbean island Member States.

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Regarding relationships with other organizations, the excellent co-operation existing at regional level between the IOCARIBE CARIPOL Programme and the Caribbean component of the UNEP Action Plan was stressed. The links established between the IOC and FAO in the implementation of the TRODERP project were also emphasized. Efforts aimed at establishing closer co-operation between the relevant IOCARIBE activities and the COSALC component of the COMAR pilot projects of the Unesco Division of Marine Sciences have also continued.

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Regarding the functioning of the Sub-Commission and the establishment of the IOC Secretariat for IOCARIBE in particular, he said that a number of steps taken by the Ministry of Foreign Affairs of Colombia would assure the availability of the building offered by Colombia in 1985 for headquarters, access to funding to cover 1987 local expenses, and early ratification of the headquarters agreement between Colombia and Unesco on behalf of the IOC.

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The Mexican delegate expressed his country's satisfaction with the considerable advances achieved in the intersessional period, stressing in particular the establishment of the IOC Secretariat for the Sub-Commission in Cartagena, Colombia, and the appointment of Dr. Fernando Robles as Senior Assistant Secretary for IOCARIBE. He also pointed out the progress made in the development of IOC's scientific programmes at regional level. Support of IOC and IOCARIBE is part of Mexico's general policy to strengthen international co-operation in the multilateral framework, particularly with the United Nations system and, within it, Unesco.

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Some delegations expressed their concern over delays in setting up the headquarters of the IOC Secretariat for IOCARIBE, with regard both to its definite physical facilities

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and to the impact this situation could have on the implementation of the various activities described in the Report submitted by the Chairman.

16           The Colombian delegate reaffirmed his country's willingness to finalize the agreement with Unesco as soon as possible to provide early solutions to these problems and confirmed the information presented by the Chairman. Regarding the headquarters, he said that if for any reason it was decided not to use the premises proposed, which house the alternative headquarters of the Chancery in Cartagena, it would be possible to find another suitably equipped building in Cartagena.

17           *The Sub-Commission urged* Colombia and Unesco to sign the corresponding Headquarters Agreement as soon as possible. *The Sub-Commission requested* Colombia in particular to furnish, even temporarily, the facilities and financial resources which would ensure the immediate operation of the IOC Secretariat for the Sub-Commission.

18           The Sub-Commission adopted the Report on Intersessional Activities submitted by the Chairman and the IOC Senior Assistant Secretary for the Sub-Commission.

#### 4.           OCEAN SCIENCE

##### 4.1          PHYSICAL OCEANOGRAPHY AND CLIMATE

19           The Chairman invited Dr. George Maul to present the conclusions and recommendations of the Workshop on Physical Oceanography and Climate held in Cartagena, Colombia, from 19 to 22 August 1986, of which Dr. Maul was one of the organizers and the Vice-Chairman (Doc. IOC Workshop Report No. 45).

20           Several delegations welcomed the Report and praised its quality. They pointed out, however, the relatively minor emphasis placed on studies of the physical oceanography of coastal zones, which are of utmost importance for most of the Sub-Commission Member States.

21           The Venezuelan delegation had some reservations regarding the content of a number of specific paragraphs of the Report, including a number of inaccuracies, and provided additional information regarding facilities mentioned as part of Venezuela's potential contribution to the proposed project. Report No. 45 was therefore amended by a Corrigendum distributed during the Session.

22           *The Sub-Commission adopted* Recommendation SC-IOCARIBE-II/1 containing the main initiatives described in this agenda item.

##### 4.2          MARINE POLLUTION RESEARCH AND MONITORING

23           The IOC Senior Assistant Secretary, Dr. G. Kullenberg, briefly introduced this item referring to the activities of the Working Committee on the Global Investigation of the Pollution in the Marine Environment (GIPME) Programme and its Marine Pollution Monitoring System (MARPOLMON), with three groups of experts charged, *inter alla*, with developing methods for the determination of contamination levels and effects thereof, the production and distribution of standards and reference materials, and the assessment of marine pollution on the global level.

24           The Symposium on Status and Trends in the Development of the GIPME Programme (Paris, 22 to 24 September 1986), had reviewed the progress made in the global and regional components, and the Sixth Session of the Working Committee for GIPME (Paris, 25 September to 1 October 1986) had noted the considerable progress made in several regions,



and in particular in the Caribbean and Adjacent Regions through the efforts of CARIPOL (Document IOC/WC-GIPME-VI/3). The Working Committee had in particular endorsed the proposal of the convening of a regional workshop to review the regional programme and define new priorities and plans, which the Nineteenth Session of the Executive Council of the IOC (Paris, 6 to 12 March 1986) had invited the Sub-Commission for IOCARIBE to consider (Document IOC/EC-XIX/3, paragraph 120).

The GIPME Working Committee had also noted the need to make the organizational framework of CARIPOL compatible with the structure of IOC Subsidiary Bodies, as called for by the Nineteenth Session of the Executive Council; in this respect, it had endorsed proposed general Terms of Reference for a possible Task Team on Marine Pollution Research and Monitoring for IOCARIBE and had referred the matter to the Sub-Commission with the suggestion that it consider the establishment of such a Task Team as a subsidiary body of the Sub-Commission.

Finally, the increasing co-operation with other Organizations, particularly UNEP, IMO and IAEA was referred to (see also Item 7.1), and it was noted that through the efforts of CARIPOL and its Steering Committee, with financial support from IOC and UNEP, major elements of the Recommendation SC-IOCARIBE-I.1 had been completed.

The Chairman then invited Dr. B. Wade, Vice-Chairman of the Sub-Commission and senior member of the CARIPOL Steering Committee, to present the report of the Steering Committee, in the absence of its Chairman, Dr. J. Corredor, who had been delayed.

Dr. Wade recalled the developments of the CARIPOL Programme and summarized its results over the last five years, emphasizing the large amount of data on petroleum hydrocarbon contamination which had been collected and stored at the RNODC of the US through the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, through the efforts of scientists and technicians in 14 Member States.

Dr. Wade referred to the CARIPOL Symposium on the Review of Petroleum Hydrocarbons in the Caribbean, La Parguera, Puerto Rico, 1-6 December 1985 (Document IOC/INF-690); the overall evaluation of the results presented there, carried out through the Steering Committee, were to be published in a dedicated issue of the *Caribbean Journal of Science* together with 20 papers presented at the Symposium. The results showed that gaps in the otherwise very good data coverage existed in the south-eastern and south-western parts of the region as well as along the southern coastlines. This implies that the assessment of sources of petroleum hydrocarbon contamination is still relatively uncertain.

Dr. Wade reported that at its meeting in Mayagüez, Puerto Rico, 24 to 28 November 1986, the Steering Committee had agreed to pursue phase II of the Programme, including observations of contamination by petroleum hydrocarbon and selected organochlorine pesticides in sentinel organisms (e.g. oysters) and sediments on a regional basis. This activity was initiated through the IOC/UNEP/UNAM Workshop held in Puerto Morelos, 9 to 21 November 1986. The Steering Committee had also recommended that a regional review workshop as referred to above be convened as a priority in order to define possible new problem areas and priorities for the programme. The Steering Committee had, *inter alia*, noted the need to consider monitoring of litter on beaches, to study contamination by urban and industrial sewage in the nearshore and coastal zone, study eutrophication in some areas, and to study biological effects of contamination.

The Steering Committee had emphasized the need for provision of equipment to a number of laboratories in order to provide analytical capability for phase II.

- 32           The Steering Committee had endorsed the general Terms of Reference, with slight amendments, for a Task Team on Marine Pollution Research and Monitoring but had suggested that instead of a Task Team, the Sub-Commission recommend the formation of a Group of Experts.
- 33           The Chairman of the CARIPOL Steering Committee, Dr. J. Corredor, after his delayed arrival, gave additional information regarding the outcome of the meeting of this *ad hoc* Committee, 24 to 28 November 1986, including recommendations for studies on: biological effects of contamination, and petroleum hydrocarbons in particular; studies of the open sea contamination by dispersed/dissolved petroleum hydrocarbons and floating tar, using ships offered by Mexico and Colombia; studies aimed at determining the sources of petroleum hydrocarbons, in consultation with Member States and other groups, in particular GEMSI. Dr. Corredor reiterated that the results of phase I of the CARIPOL Programme had been obtained through simple means and wide participation. The continued implementation of phase II of the programme, however, would require much more sophisticated equipment, methods of sampling and analysis, data quality control and training; it would require a substantial increase in the support supplied through the Organizations and, mainly, through contributions from Member States. Dr. Corredor also stressed the need for good, continuous communication, co-operation and co-ordination between the GIPME group of experts and the regional groups, referring in particular to GEEP. It was noted that the Vice-Chairman of GEEP, Dr. Judy Capuzzo, had in fact participated in the last meeting of the Steering Committee, but the Steering Committee considered that further detailed consultations were required with regard to the possible implementation of proposed activities of GEEP in the region, and suggested that liaison could be secured by inviting the Chairman of the Committee to participate in the meetings of GEEP.
- 34           *The Sub-Commission expressed its appreciation* for the results obtained in the CARIPOL phase I programme and *strongly endorsed* the continuation of the Programme through pursuance of the implementation of its phase II.
- 35           *The Sub-Commission recommended* that the monitoring programme include substances other than petroleum hydrocarbons, in particular selected pesticides. However, it was clear that for this purpose, further training and intercalibration would be necessary.
- 36           *The Sub-Commission emphasized* that common, intercalibrated and tested methods should be employed in the programmes, as done during phase I.
- 37           Several delegations presented additional information about ongoing or planned activities, and the delegate of Venezuela in particular reported that a national programme to study contamination by petroleum hydrocarbon residues had been initiated, with observations to start in 1987.
- 38           The delegate of the USA put forward the offer from the US/NODC and AOML/NOAA to continue serving jointly as an RNODC for marine pollution data from the IOCARIBE region.
- 39           *The Sub-Commission took note of that offer with appreciation.*
- 40           Several delegations emphasized the need for training at different levels of sophistication.
- 41           *The Sub-Commission recommended* increased efforts in that area.

*The Sub-Commission endorsed* the convening of a regional workshop as a matter of priority to review the results of the regional marine pollution research and monitoring programme so far, identify new problem areas, further elaborate the programme and set priorities for its implementation. 42

*The Sub-Commission also endorsed* the formal transformation of the CARIPOL Steering Committee into a Group of Experts and *recommended* that Member States nominate members and identify national focal points for the GIPME Programme and its regional component on Marine Pollution Research and Monitoring. 43

*The Sub-Commission noted and strongly endorsed* the increasing co-operation with other Organizations and Programmes, especially UNEP, and recommended that these efforts be further pursued with the aim of further strengthening the co-ordination and co-operation for the benefit of all Member States. 44

*The Sub-Commission adopted* Recommendation SC-IOCARIBE-II.2. 45

#### 4.3 REGIONAL COMPONENT OF OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

This item was introduced by the Technical Secretary on behalf of the Chairman of the OIC/FAO Workshop on Recruitment in Tropical Coastal Demersal Communities (Ciudad del Carmen, Campeche, Mexico, 21 to 25 April 1986, OIC Workshop Report No. 44), Dr. Alejandro Yáñez Arancibia, of the Instituto de Ciencias del Mar y Limnología, UNAM. Dr. Yáñez' paper was distributed to the Sub-Commission as Document SC-IOCARIBE-II/Inf. 4 and contains the following proposals for immediate follow-up to the Workshop recommendations: i) to establish a regional Group of Experts specialized in recruitment processes in tropical coastal demersal communities; and ii) to convene an early meeting of that Group of Experts to identify priorities and implement planned projects. 46

The Colombian delegation offered to host the First Session of the regional Group of Experts on OSLR/TRODERP. 47

*The Sub-Commission recommended full support* for the studies provided and the Recommendations contained in Workshop Report No. 44 and the immediate implementation of measures suggested by the Workshop Chairman. 48

*The Sub-Commission also emphasized* the multidisciplinary nature of these studies, and their social and economic importance for the management of living resources in many IOCARIBE Member States. 49

*The Sub-Commission welcomed* the excellent co-operation ties established with FAO for implementation of the Programme of Ocean Science in Relation to Living Resources (OSLR), and especially the TRODERP initiative, and *stressed* the possibility of COPACO participation in some areas of this collaboration. 50

*The Sub-Commission expressed* its gratitude to the Instituto de Ciencias del Mar y Limnología, UNAM, and to the Instituto Nacional de la Pesca de Mexico for the excellent facilities provided for the Workshop. *The Sub-Commission also expressed* its appreciation for Colombia's offer to host the First Session of the regional Group of Experts. 51

*The Sub-Commission adopted* Recommendation SC-IOCARIBE-II.3. 52

As part of another regional component of the OSLR Programme, the Chairman then invited Dr. Robert Lankford, in his capacity as Secretary of the Executive Committee of 53

WATS-II, to give a progress report on the organization of the Second Western Atlantic Turtle Symposium. Dr. Lankford expounded on the background of this initiative and the organization of this Symposium, which information is contained in document SC-IOCARIBE-II/Inf. 5. He added that the implementation of these activities was the result of recommendations presented at the First Session of the Sub-Commission, and that financial support for them was raised during the intersessional period exclusively from extra-budgetary resources provided by Member States of the region.

54            *The Sub-Commission congratulated* the Executive Committee of WATS-II for the measures taken toward the convening of the Second Western Atlantic Turtle Symposium, and *urged* Member States to take an active part, in accordance with the Executive Committee's recommendations, in order to ensure that it have the same success as the First Symposium.

55            The Chairman then asked Dr. Lankford to introduce another regional component of the OSLR Programme. This one refers to mass mortality of marine organisms in the IOCARIBE region, including its association with red tide phenomena. Dr. Lankford recalled previous measures adopted by IOCARIBE in view of this recurrent phenomenon, especially the recommendations contained in the Summary Report of the IOCARIBE Steering Committee for Developing Regional Contingency Measures, held in Mayagüez, Puerto Rico, on 25 to 29 October 1982. He noted that there had been no follow-up to this initiative during the intersession, and stressed the need to resume action for its implementation.

56            The Technical Secretary informed the Sub-Commission that the item on phytoplankton florescence, red tides and associated mortality of marine organisms had been recommended by the IOC Assembly as a second major component of the OSLR Programme and that the IOCARIBE initiative could be included in this more comprehensive context. He said that at the request of many IOC Member States, this major component would be examined during the 2nd Meeting of the Group of Experts on OSLR to be held at FAO in Rome in June 1987.

57            The delegate of France informed the Sub-Commission that within the framework of the priorities set by the European Consortium on Marine Sciences, this was considered a high-level research topic. Therefore, IOCARIBE initiative could become a good point of scientific contact with similar initiatives being considered by the Consortium.

58            *The Sub-Commission reaffirmed* its support for the resumption of actions aimed at implementing the recommendations of the Steering Committee for Developing Regional Contingency Measures in view of unusual mass mortality of marine organisms, as one of the components of the OSLR interregional project on phytoplankton blooms, red tides and kills of marine organisms.

59            *The Sub-Commission adopted* Recommendation SC-IOCARIBE-II.4.

#### 4.4            REGIONAL COMPONENT OF OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

60            Prof. Michel Vigneaux, Chairman of the IOC-UN (OETB) Guiding Group of Experts on Ocean Science in Relation to Non-Living Resources (OSNLR), presented this agenda item and briefly outlined the main recommendations of the Group's first meeting (Unesco, Paris, January 1985). He stressed the importance attached by the Guiding Group to coastal processes and non-living resources. To that end, the Guiding Group defined a global concept included in the programme entitled SETMY (Sea Level Environment and Tectonics during the Last Million Years). This programme underlines the multidisciplinary nature of these studies and the need to develop them together with other related studies and other national and international programmes. These considerations were borne in mind at the IOCARIBE Mini-Sympo-

sium for the Regional Development of the IOC-UN (OETB) Programme on OSNLR (Doc. IOC/OSNLR/CARIBMSYM-I/3), held in Havana on December 4 to 7, 1986.

Topics related to the deep sea environment were not overlooked at the Mini-Symposium, however, especially the field of palaeo-oceanography. The Mini-Symposium's recommendations were outlined by Prof. Vigneaux as follows:

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- (i) Give priority to studies on beach dynamics and monitoring.
- (ii) Undertake the preparation of seabed substrate maps and geomorphological maps of coastal areas.
- (iii) Examine the possibility of pilot-area studies related to coastal area monitoring and protection.
- (iv) Support Quaternary palaeo-oceanographic studies in relation to sea-level changes.
- (v) Undertake geophysical studies of the geotectonic and morphostructural features of some Caribbean regions.
- (vi) Recommend the establishment of a panel of experts on coastal research for the purpose of assisting IOCARIBE Member States.
- (vii) Seek cooperation with relevant COSALC programmes of the COMAR project of the Marine Sciences Division of Unesco.
- (viii) Support all the above-mentioned activities with a strong training and mutual assistance (TEMA) component.

*The Sub-Commission expressed its satisfaction* with the good work and results of the International Mini-Symposium and the relevance of its recommendations for the progress of the regional component of the OSNLR Programme. Therefore, *the Sub-Commission endorsed* the Mini-Symposium's recommendations, contained in Document IOC/OSNLR-CARIBMSYM-I/3, including the training offers, especially those expressed and confirmed during the Session by the Cuban Delegation. *The Sub-Commission also took note with satisfaction* of the offer to this effect made by France to organize a course on the Administration and Management of Coastal Areas in the region during 1987-88, similar to the one given in Bordeaux in 1984 for scientists from IOCARIBE and West Africa.

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*The Sub-Commission likewise expressed* its appreciation for the offer made by the Venezuelan Delegation aimed, in particular, at:

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- (i) the convening in 1988 of a workshop on coastal geomorphology, sediment dynamics and coastal area management,
- (ii) facilitating the participation of geologists from the IOCARIBE region in research undertaken by Venezuela on various aspects of the coastal area, for periods of one to two months.

The Venezuelan Delegation expressed the willingness of its Dirección de Geología of the Ministerio de Energía y Minas to cover the costs of the stay of foreign participants in these training and research activities and asked the IOC to examine the possibility of supplementing this offer by covering travel expenses.

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65 Finally, *the Sub-Commission stressed* the relationship between the Mini-Symposium's recommendations and the Project for the International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean Off Central America, contained in agenda item 4.5.

66 *The Sub-Commission adopted* Recommendation SC-IOCARIBE-II.5.

4.5 OCEAN MAPPING AND THE INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA AND PART OF THE PACIFIC OCEAN OFF CENTRAL AMERICA (IBCCA)

67 This agenda item was introduced by Dr. Nestor Duch Gary, Chairman of the First Session of the IOC Editorial Board for the IBCCA (Aguascalientes, Mexico, 29 September to 2 October 1986, Doc. IOC/EB-IBCCA-1/3), and Chief Editor of that International Bathymetric Chart. Dr. Duch Gary reported on the main results of the First Session of the IBCCA Editorial Board, and noted that the Board analyzed and adopted its mandate; evaluated existing national maps on a scale of 1:1,000,000 and above; designed a plotting sheet diagram for preparing the IBCCA and established the appropriate specifications; and ascertained potential national participation in the project from among the experts present. He concluded his remarks by extending an invitation to the Member States not present at the First Session to take responsibility for the preparation of the initially unassigned plotting sheets.

68 *The Sub-Commission expressed its satisfaction at* and congratulated the IBCCA Editorial Board for its excellent work in implementing this project.

69 The following Member States formally reaffirmed their willingness to take responsibility for preparing the plotting sheets indicated in each case: Colombia, sheets Nos. 1-15 and 1-21; USA, sheets Nos. 1-01, 1-02, 1-03, 1-04 and 1-09; France, sheets Nos. 1-10, 1-18 and in collaboration with Trinidad and Tobago and Venezuela, 1-17; and Mexico, sheet No. 1-06. *The Sub-Commission assumed* that Costa Rica was still willing to take responsibility for sheet No. 1-14.

70 The delegate of Cuba stated that because of last-minute developments, the Cuban expert was unable to attend the First Session of the Editorial Board. Nevertheless, the delegate reaffirmed Cuba's great interest in participating actively in the IBCCA project and in taking responsibility for plotting sheets Nos. 1-07 and 1-08.

71 The delegation of Venezuela likewise reaffirmed its interest and its willingness to be responsible for plotting sheet No. 1-16 and in collaboration with France and Trinidad and Tobago, Sheet No. 1-17.

72 The delegation of Venezuela invited the IBCCA Editorial Board to hold its Second Session in Venezuela in the second quarter of 1988. The Delegation of Cuba, which had expressed the same interest at the IOC Assembly, reiterated Cuba's willingness to serve as alternate host if the Venezuelan proposal could not be followed through.

73 The delegation of Mexico offered the facilities of its country's Dirección General de Geografía to provide advice and training in the task of cartographic compiling, editing and printing related to the IBCCA Project.

74 The United States delegation offered to organize, in co-ordination with the IOCARIBE Secretariat, a workshop on a topic relevant to the IBCCA Project to be held in Boulder, Colorado, where the World Geological and Geophysical Data Center (A) has its headquarters.

*The Sub-Commission stressed* the great interest of the countries of the region in the IBCCA project and warmly *thanked* the above-mentioned delegations for their offers in support of this initiative. At the same time, it *thanked* the Government of Mexico for the excellent facilities provided for the First Session of the Editorial Board and the commitment it had made with regard to the final publication of the Bathymetric Chart. 75

## 5. OCEAN SERVICES

### 5.1 REGIONAL COMPONENT OF THE INTEGRATED GLOBAL OCEAN SERVICE SYSTEM (IGOSS)

Mr. John Withrow, Assistant Secretary of the IOC, presented a brief description of the IGOSS system. 76

The members of the Sub-Commission were invited to comment on the items contained in the Annotated Agenda and on the feasibility of participating in IGOSS in conjunction with GLOSS and their own regional programmes for physical oceanography and climate developed at the workshop on that subject held in Cartagena (19-22 August 1986). 77

Several delegations indicated that they did not have sufficient information on how the collection and distribution of real and near real-time data would be of benefit to them. 78

In the same way, many delegations stated that they would be unable to use the real-time data that the System would make available to them. They felt that in addition to the equipment and training necessary to collect the data, there was need for equipment and training in order to process it. *The Sub-Commission requested* that IGOSS provide Member States with information on how real and near real-time data could best be applied to research concerning, for example, coastal dynamic processes. *The Sub-Commission also requested* information from the IOC Secretariat on how regional participation would benefit from and relate to global programmes such as TOGA and WOCE and others connected with the oceanic component of the World Climate Research Programme (WCRP). 79

### 5.2 OCEAN OBSERVING SYSTEMS

#### 5.2.1 *Regional components of the Global Sea-Level Observing System (GLOSS)*

The Assistant Secretary presented Doc. SC-IOCARIBE-II/8 Annex 1 "IOCARIBE Regional Component of the Global Sea-Level Observing System (GLOSS)" and suggested that Members of the Sub-Commission commit those sea-level stations listed in the global plan. At the same time, he requested a response to the questionnaire contained in the document. 80

Several delegations again noted that they did not understand how their participation in the global sea-level programme would benefit them. They did, however, enthusiastically support the implementation of a regional system. The delegate of the United States noted that his country was firmly committed to the global system and would be interested in providing equipment and assistance within the region in that context. The same delegate also pointed out that other sea-level equipment may become available over the next 4 to 5 years that could be used in the implementation of the regional programme. Both Mexico and Venezuela indicated that they had some equipment in place and were willing to begin participation in the regional programme. Many countries within the region would need equipment and training in order to participate in the sea-level programme and to derive benefit from it. 81

*The Sub-Commission felt* that an effort should be made to locate the global sea-level gauges where they would also benefit the regional programme whenever possible. 82

5.2.2 *Future requirements for ocean monitoring*

83 *The Sub-Commission noted* that future requirements for IGOSS, GLOSS and IODE were included within the discussions of those particular Agenda topics. *The Sub-Commission recommended* the Member States to consider the utilization of microcomputers and the standardization of medium and format for the exchange of oceanographic data within the region.

84 The IOC Assistant Secretary noted that this subject had been addressed at the twelfth Session of the Working Committee on IODE (Moscow, USSR, 10-17 December 1986) (see also item 5.3).

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

85 The IOC Assistant Secretary gave details on the structure and function of IODE. He described the state of the regional implementation of IODE and urged Member States of the Sub-Commission to appoint national IODE contacts and make their data available for international and regional exchange. He also expanded on data exchange via microcomputer, mentioned under the previous item. The Session was invited to comment on the items contained in the Agenda and on the use of microcomputers in particular.

86 Many of the IOCARIBE countries were already making efforts to start their National Oceanographic Data Centres but needed further training in the organization and functions of the NODC. Some Member States indicated that they would need assistance in the procurement of the equipment. With respect to training needs the Assistant Secretary of the IOC noted that successful training courses on the implementation of National Oceanographic Data Centres had been held in other regions. The delegate of Colombia endorsed the idea of a training course and volunteered to host such a workshop.

87 *The Sub-Commission reaffirmed* that it was important for the Member States to increase their efforts to participate in IODE.

88 The Sub-Commission adopted Recommendation SC-IOCARIBE-II-6.

5.4 REGIONAL SYSTEMS FOR MARINE INFORMATION MANAGEMENT

89 This item was introduced by the Technical Secretary who noted that efforts had been made to implement two initiatives in the field of marine science information management during the intersession. The first was made through the Sub-Commission Chairman who had submitted for Unesco consideration a project proposal to set up, in the IOCARIBE Secretariat, a Regional Information Exchange Network on Oceanography in the Caribbean and Adjacent Regions, to be funded by the 1984-85 regional participation programme. This project proposal could not be financed with the resources allotted to the above-mentioned programme because of the large number of proposals submitted and Unesco's budget reductions in 1985. The second was a subregional initiative begun in November 1986 through a consultant mission to some island countries in the Western Caribbean — Barbados, Jamaica and Trinidad and Tobago — to examine the possibility of establishing a subregional marine science information network and oceanographic data exchange within the framework of the existing systems.

90 Several delegations provided additional information about existing or developing systems within the region that should be taken into account and co-ordinated if either of the above-mentioned initiatives is implemented.



*The Sub-Commission recommended*, however, that the IOCARIBE Chairman and the IOC Secretariat follow these initiatives closely. 91

*The Sub-Commission adopted* Recommendation SC-IOCARIBE-II.7. 92

## 6. TEMA ACTIVITIES IN SUPPORT OF THE SUB-COMMISSION'S PROGRAMMES

### 6.1 STRATEGY FOR IMPLEMENTING TEMA AND IDENTIFICATION OF ITS COMPONENTS

Introducing this agenda item, the Technical Secretary said that it could be approached from two points of view. One was in a long-term approach under the Unesco/IOC Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Member States. The other had to do with the specific training, education and mutual assistance (TEMA) components of each of the project proposals contained in the research and service programmes already examined. The Major Assistance Programme was a longterm initiative that was basically at the stage of collecting data on the supply and demand of TEMA needs, and was being implemented through country profiles. Therefore, the specific TEMA components earmarked for research and service programmes given priority by the Sub-Commission created the possibility for shorter-term implementation. 93

*The Sub-Commission endorsed* the above-mentioned approach and reiterated its gratitude for the various offers submitted by Member Countries regarding the TEMA components of the revised project proposals, and *urged* Member States to channel any further TEMA offers through the ongoing initiatives. 94

### 6.2 REGIONAL NETWORK OF HIGHER EDUCATION AND RESEARCH INSTITUTIONS

The IOC Senior Assistant Secretary for IOCARIBE introduced this item, referring to Document SC-IOCARIBE-II/Inf. 7. He stressed that this was only a preliminary draft intended to stimulate discussion on the subjects included in Recommendation SC-IOCARIBE-I.6. 95

*Some delegations considered* that the reference document did not meet the proposed requirements for Recommendation SC-IOCARIBE-I.6. 96

*The Sub-Commission noted* that several networks already exist, for example UNICA (Association of Universities of the Caribbean), the Union of Latin American universities, or others of a bi- or multi-lateral nature. Other networks are in preparation following decisions by other organizations, including the UNEP Caribbean Environment Programme, which covers both the respective environmental laboratories, and the formulation of thematic modules within the framework of its network for Environmental Training in Latin America and the Caribbean. Once the network of environmental laboratories in marine sciences has been formally established by UNEP, its follow-up would be entrusted to the Secretariat of the IOC for IOCARIBE. 97

*The Sub-Commission agreed* that duplication should be avoided and *decided* that the relevant networks should be contacted by the Secretariat of the IOC for IOCARIBE in order to obtain precise information on their coverage and operational mechanism before further action was taken on the proposal presented in Document SC-IOCARIBE-II/Inf.7. 98

*The Sub-Commission also agreed* that the growing number of networks in the region suggests that a need for contact, co-operation and exchange of information exists. 99

100            *The Sub-Commission reaffirmed* that efforts should be made through the Secretariat to establish the need for and willingness of Member States to participate in a consortium or association of institutions for higher education and research in marine science in the region. Such a mechanism could e.g. serve to transmit information on: available courses, graduate studies and associated requirements, financial requirements and possibilities to obtain support, as well as on-going and planned projects. It would also facilitate spreading of information about IOCARIBE among scientists in the region and help increase regional co-operation in marine science in general.

101            Reference was made in this context to the newly formed European Association of Marine Science and Technology Institutions which encompasses *inter alia* higher education and research institutions belonging to universities. Within the framework of that Association several networks of research laboratories were being formed dealing with specific subject areas of region-wide interest in current marine research.

102            *The Sub-Commission suggested* that the initiatives within IOCARIBE could benefit from the experiences made within the European Association, and *agreed* that the Secretariat would take appropriate steps to obtain that information in due course.

103            *The Sub-Commission recommended* that the Secretariat should investigate in the intersessional period the possibility of establishing an association or consortium of higher education and research institutions dealing with marine science and technology in the Caribbean and adjacent regions, and the requirements for implementing and operating such an association.

### 6.3            SUPPORT TO REGIONAL RESEARCH AND SERVICES PROGRAMMES

104            *The Sub-Commission considered* that this agenda item had been sufficiently developed in the subjects previously discussed, particularly those expanded on under items 4 and 5.

## 7.            CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES

### 7.1            UNEP REGIONAL SEAS ACTION PLAN FOR THE CARIBBEAN ENVIRONMENT PROGRAMME

105            The IOC Associate Expert, Mr. Anders Alm, briefly described the fruitful regional co-operation between IOC and UNEP, especially in the field of Marine Pollution Research and Monitoring. Reference was made to the Report of the First IOCARIBE Session where the aide-memoire of UNEP co-sponsoring the Group of Experts on Methods, Standards and Inter-calibration (GEMSI) was discussed.

106            It had not been possible for UNEP to be represented at the present session, which was regretted in a telex sent from the Acting Coordinator, Mr. Rodriguez, to the UNEP Regional Coordination Unit in Kingston, Jamaica.

107            The increased regional co-operation between UNEP and IOC was demonstrated through the Intersecretariat Consultation, Paris, December 1985, and the aide-memoire of the meeting of Geneva, August 28-29, 1986 concerning collaboration between UNEP and IOC in the framework of the UNEP Action Plan for the Caribbean and South-East Pacific Environment Programme. In this, IOC and UNEP agreed that an IOC staff member, supported from UNEP funds, would be outposted to the Co-ordinating Unit for the Caribbean Action Plan, Kingston, Jamaica, to facilitate collaboration between the two organizations at the regional level.

The IOC Associate Expert referred to the IOC/UNEP-sponsored CARIPOL Symposium on the Review of Petroleum Hydrocarbons, La Parguera, Puerto Rico, 1-6 December 1985, and the Training Workshop on Analysis of Petroleum Hydrocarbons in Organisms and Sediments, Puerto Morelos, Mexico, 9-21 November 1986. He noted that it was desirable to seek UNEP co-operation for the recommended CARIPOL Workshop on the Review and Further Development and Implementation of the Marine Pollution Research and Monitoring Programme in the Caribbean. 108

As an example of interregional co-operation between IOCARIBE and UNEP/CPPS, scientists from the South-Eastern Pacific region participated in the Puerto Morelos Workshop. 109

*The Sub-Commission expressed* its great satisfaction with the considerable increase in co-operation between IOC and UNEP and *noted with satisfaction* UNEP's agreement to finance the outposting of an IOC staff member at the Regional Co-ordination Unit of UNEP to work in close collaboration with the Senior Assistant Secretary of IOC for IOCARIBE. 110

*The Sub-Commission strongly encouraged* a further strengthening of the cooperation with UNEP, especially between IOCARIBE/CARIPOL and the UNEP/Caribbean Action Plan. 111

## 7.2 UNESCO MAJOR INTERREGIONAL PROJECT ON RESEARCH AND TRAINING LEADING TO THE INTEGRATED MANAGEMENT OF COASTAL SYSTEMS (COMAR) 113

The representative of the Unesco Division of Marine Sciences, Dr. Marc Steyaert, presented this agenda item. He examined the components of the COMAR Project for Latin America and the Caribbean (COSALC) in detail and said that three of the seven pilot projects were at the application and/or implementation stage. They are: COSALC-I – Pilot Project on Shoreline and Beach Stability; COSALC-II – Coastal Lagoons in Latin America; COSALC-III – Productivity in the Coastal Zones of the Caribbean (CARICOMP). The representative of the Unesco Division of Marine Sciences noted that those pilot projects were being carried out in co-ordination with various regional programmes, governmental and non-governmental, and suggested the usefulness of specific exchanges with similar IOCARIBE projects, especially the regional components of OSNLR. 112

*The Sub-Commission thanked* the Unesco Division of Marine Sciences for the presence of its staff member at the IOCARIBE Second Session despite the many activities requiring his attention at this time of the year. It was nevertheless regretted that the Division was unable to follow up other pertinent agenda items where there was a clear need for improved co-operation. 113

*The Sub-Commission stressed* the benefits that IOCARIBE Member States could derive from specific exchanges under relevant programmes of the Sub-Commission and the COMAR Project. 114

*The Sub-Commission recommended* the establishment of exchanges in other spheres of common interest, such as COSALC-II (Coastal Lagoons in Latin America) and COSALC-III (Productivity in the Coastal Zones of the Caribbean – CARICOMP), and noted that Project No. 3 on Beach Dynamics and Monitoring, recommended by the IOCARIBE Mini-Symposium for the Regional Development of OSNLR, offered a unique opportunity to initiate this co-operation and that to this end the COSALC-I Project (Pilot Project on Shoreline and Beach Stability) should be taken into consideration. 115

116                    *The Sub-Commission adopted* Recommendation SC-IOCARIBE-II/8.

8.                    PROGRAMME AND BUDGET FOR 1987

117                    Introducing this agenda item, the Technical Secretary referred to document SC-IOCARIBE-II/Inf. 8, and stressed that it was merely a reference document to give an indication of the budgetary resources of both the Unesco regular budget and the contribution to the IOC Trust Fund earmarked for IOCARIBE activities during 1986. He emphasized that in addition funds existed for the post of IOC Senior Assistant Secretary for IOCARIBE and for Sweden's posting of an Associate Expert to the IOC to work in the Secretariat of the Commission.

118                    *The Sub-Commission considered* that despite the fact that the figures mentioned in document SC-IOCARIBE-II/Inf. 8 were relatively modest, the multiplier effect of the activities already funded showed the importance of continuing to support the programmes, undertaken or recommended by IOCARIBE.

119                    *The Sub-Commission thanked* Sweden for posting an associate expert to the IOC Secretariat for IOCARIBE, as this represented an important contribution.

120                    *The Sub-Commission urged* Member States to continue to contribute additional resources for IOCARIBE programmes through the IOC Trust Fund and *recommended* that, in consultation with the Secretary of the IOC, the Sub-Commission officers undertake the necessary official contacts.

121                    *The Sub-Commission noted* Cuba's generous offer to provide interpretation and translation services for IOCARIBE events, and to defray part of the cost involved.

9.                    OTHER MATTERS

122                    *The Sub-Commission decided*, under this agenda item, to take the following action:

123                    *It requested* the IOC Secretariat for IOCARIBE to ask Member States to prepare National Reports of IOCARIBE activities for submission in writing to the Third Session of the Sub-Commission.

124                    *It requested* the IOC Secretariat for IOCARIBE to undertake the publication and wide distribution of an IOCARIBE Newsletter to disseminate information on projects, activities and other relevant matters.

125                    *It urged* the IOC Secretariat to be more prompt in publishing the results of workshops, sessions of working groups, and missions relevant to the region, the report of the January-February 1985 mission to the Eastern Caribbean Member State in particular.

126                    *It requested* the Member States and the IOC Secretariat for IOCARIBE to obtain the names and addresses of IOCARIBE National Associates in each country as well as the additional addresses of governmental contacts and to make these available to all Member States of the Sub-Commission.

127                    The Delegate of Mexico reported that the JOA is organized by SCOR and numerous Mexican institutions with the support of the IOC and Unesco. The JOA is a scientific meeting with world-wide participation and an interdisciplinary approach which includes all aspects of marine science. It is usually held every six months.

*The Sub-Commission urged* Member States to encourage IOCARIBE scientists to participate in the *Joint Oceanographic Assembly* (JOA) scheduled for Acapulco, Mexico, 23-31 August 1988. 128

*The Sub-Commission requested* the IOC Senior Assistant Secretary for IOCARIBE, in consultation with the Chairman, to invite Member States to associate themselves with the IOC and with the Sub-Commission. 129

*The Sub-Commission accepted* the offer of the United States to provide the IOC Secretariat for IOCARIBE with copies of a digest of the legislation of various Member States in the region concerning scientific research in maritime areas under their jurisdiction. 130

*The Sub-Commission requested* the IOC Secretariat for IOCARIBE to transmit this information by circular letter or newsletter to the Member States. 131

#### 10. ELECTION OF THE OFFICERS OF THE SUB-COMMISSION

The delegate of the Netherlands proposed that the Chairman, Capitán Rafael Steer Ruiz and the Vice-Chairman, Dr. Barry Wade, be re-elected for a new intersessional period and the next Session of the Sub-Commission. 132

*The Sub-Commission unanimously approved* this proposal and *reelected* Mr. Steer Ruiz and Mr. Wade as Chairman and Vice-Chairman, respectively, for a further inter-session period and the next Session of the IOC Sub-Commission for IOCARIBE. 133

Capitán Steer Ruiz thanked the meeting for his reelection and noted that he considered this a vote of confidence in his leadership. He reaffirmed his readiness to make his best effort toward the implementation of the activities and programmes adopted by the Sub-Commission. Dr. Barry Wade expressed similar sentiments and added that when the headquarters of the IOC Secretariat for IOCARIBE is finally set up in the region, he looked forward to close co-ordination and communication between the Officers and the Secretariat of the Sub-Commission. 134

#### 11. DATES AND PLACES OF THE THIRD SESSION OF THE SUB-COMMISSION

Given the interest expressed by a number of delegations, Colombia stated his intention of exploring with the corresponding authorities the possibility of hosting the Third Session of the IOC Sub-Commission for IOCARIBE in Cartagena in approximately two years. 135

The delegations of France and Venezuela offered to host the Fourth Session of the Sub-Commission in Martinique (or Guadeloupe) and Caracas, respectively. 136

#### 12. ADOPTION OF THE SUMMARY REPORT

*The Sub-Commission adopted* the Summary Report of its Second Session. 137

#### 13. CLOSURE

**ANNEX 1**

**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 SCIENCE**
  - 4.1 Physical Oceanography and Climate**
  - 4.2 Marine Pollution Research and Monitoring**
  - 4.3 Regional Component of Ocean Science in Relation to Living Resources (OSLR)**
  - 4.4 Regional Component of Ocean Science in Relation to Non Living Resources (OSNLR)**
  - 4.5 Ocean Mapping and the International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean Off Central America (IBCCA)**
- 5. OCEAN SERVICES**
  - 5.1 Regional Component of the Integrated Global Ocean Station System (IGOSS)**
  - 5.2 Ocean Observing Systems**
    - 5.2.1 Regional Component of the Global Sea-Level Observing System (GLOSS)**
    - 5.2.2 Future Requirements for Ocean Monitoring**
  - 5.3 Development of the International Oceanographic Data Exchange (IODE) System to meet Regional Needs**
  - 5.4 Regional Systems for Marine Information Management**
- 6. TEMA ACTIVITIES IN SUPPORT OF THE SUB-COMMISSION'S PROGRAMMES**
  - 6.1 Strategy for Implementing TEMA and Identification of its Components**
  - 6.2 Regional Network of Higher Education and Research Institutions**
  - 6.3 Support to Regional Research and Services Programmes**
- 7. CO-OPERATION WITH OTHER ORGANIZATIONS AND PROGRAMMES**
  - 7.1 UNEP Regional Seas Action Plan for the Caribbean Environment Programme**
  - 7.2 UNESCO Major Interregional Project on Research and Training Leading to the Integrated Management of Coastal Systems (COMAR)**

- 8. PROGRAMME AND BUDGET FOR 1987**
- 9. OTHER MATTERS**
- 10. ELECTION OF THE OFFICERS OF THE SUB-COMMISSION**
- 11. DATES AND PLACE OF THE THIRD SESSION OF THE SUB-COMMISSION**
- 12. ADOPTION OF THE SUMMARY REPORT**
- 13. CLOSURE**

**ANNEX II**

**ADOPTED RECOMMENDATIONS**

<b><i>Recommendation number</i></b>	<b><i>Title</i></b>
SC-IOCARIBE-II.1	IOCARIBE Programme in Physical Oceanography and Climate
SC-IOCARIBE-II.1	Regional Programme on Marine Pollution Research and Monitoring
SC-IOCARIBE-II.3	Recruitment in Tropical Coastal Demersal Communities
SC-IOCARIBE-II.4	Regional Response to Mass Fish Mortalities in the IOCARIBE Region
SC-IOCARIBE-II.5	Regional Component of the Programme on Ocean Science in Relation to Non-Living Resources
SC-IOCARIBE-II.6	Development of the International Oceanographic Data Exchange (IODE) System in the IOCARIBE Region
SC-IOCARIBE-II.7	Regional System for Marine Information Management
SC-IOCARIBE-II.8	Interaction between IOCARIBE and the COSALC Component of COMAR of the Division of Marine Sciences of Unesco



**RECOMMENDATION SC-IOCARIBE-II.1**

**IOCARIBE PROGRAMME IN PHYSICAL OCEANOGRAPHY AND CLIMATE**

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

***Recalling*** Recommendation SC-IOCARIBE-I.5,

***Recognizing*** the progress made in developing an IOCARIBE programme in physical oceanography and climate (POCCAR),

***Supports*** the conclusions of the IOCARIBE Workshop on Physical Oceanography and Climate published in IOC Workshop Report No. 45, as amended during the Second Session of the Sub-Commission by the Corrigendum dated 10 December 1986;

***Recommends*** that the following actions be endorsed by the Fourteenth Session of the IOC Assembly, March 1987:

- (i) establishment of a Group of Experts to implement the recommendations outlined in IOC Workshop Report No. 45 as amended;
- (ii) holding of a POCCAR programme Implementation Workshop by the Group of Experts during 1987, to consider priorities, *inter alia*, for the sea-level/weather stations, with respect to the GLOSS System and those required for POCCAR;
- (iii) planning, by the Group of Experts, of the regional Workshop on physical oceanography of coastal zones;
- (iv) taking advantage of benefits to the region in using IGOSS to provide rapid and accurate data exchange; to that end, the POCCAR Group of Experts will initiate an experiment to determine the best use of the system by transmitting nowcasts of Strait of Florida sea-level for estimating Gulf Stream System surface current speeds;
- (v) encouraging progress in the development of regional numerical modelling and data capture through participation in the ESA/ERS-1 and NASA/CNES-TOPEX/POSEIDON satellite programmes aiming at producing nowcasts of transport and surface circulation;
- (vi) the establishment of links with the European Oceanological Network and other such consortia for the purposes of bilateral and multilateral expert consultations including TEMA activities;
- (vii) the investigation of efficient data exchange mechanisms emphasizing MDOS format on 5 1/4 inch disks for use in personal computers and IODE activities;
- (viii) encouraging regional participation in the expansion of the POCCAR bibliography, so that information exchange may be continually updated;
- (ix) encouraging participation by regional scientists in the form of presentation of relevant papers at specialized meetings of the Spring 1987 AGU Special Session on the Caribbean Sea, and the August 1988 Joint Oceanographic Assembly (JOA).

***Urges*** IOCARIBE Member States to participate in the Group of Experts and in the IOGOSS data network;

***Requests*** the IOC Secretary to make every effort to obtain the funds required to undertake the Workshops and other activities of the POCCAR Group of Experts.

### **RECOMMENDATION SC-IOCARIBE-II.2**

#### **REGIONAL PROGRAMME ON MARINE POLLUTION RESEARCH AND MONITORING**

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

***Noting*** the great success and important results of the CARIPOL Programme so far,

***Considering*** the wide interest and participation of the Member States in the Programme,

***Recognizing*** the work carried out by the CARIPOL Steering Committee,

***Strongly recommends*** the continuation of Phase I of the Programme as the regional component of GIPME/MARPOLMON;

***Strongly supports*** the dedication of funds and efforts to the continued and strengthened implementation of Phase II of the Programme, including training, intercalibration activities, provision of equipment, and standards and reference materials, and ***urges*** Member States to support the Programme actively;

***Recommends*** that implementation of other CARIPOL components suggested by the Steering Committee be initiated to the extent funds and other sources permit, including biological effects studies and open sea baseline studies;

***Also recommends*** that a Regional Review Workshop on Marine Pollution Research and Monitoring in the Caribbean and Adjacent Regions be jointly convened and sponsored by IOC, through IOCARIBE, UNEP and possibly other organizations, to be held in 1988 or 1989;

***Further recommends*** that a Group of Experts on Marine Pollution Research and Monitoring be established with the Terms of Reference as given in the Annex to this Recommendation, ***recommends*** that the present members of the CARIPOL Steering Committee be nominated as members of the Group of Experts, and ***requests*** the present Steering Committee to continue its functions until the Group of Experts has been formally established.

#### ***Terms of Reference of the IOCARIBE Group of Experts for Marine Pollution Research and Monitoring in the Caribbean and Adjacent Regions***

##### **(i) *Basic Function***

The Group of Experts shall propose for the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) projects or activities to develop regional components of the IOC Programme for the Global Investigation of Pollution in the Marine Environment (GIPME) and those related to MARPOLMON, and to address specific marine pollution problems in the Caribbean and adjacent areas; it shall formulate proposals for marine pollution research and monitoring contributing to the declared goals of the Caribbean Action Plan (CAP) of UNEP.

(ii) ***Planning***

It shall prepare a detailed plan of action for implementation of the adopted projects or activities.

(iii) ***Promotion***

Within its field of responsibility, it shall promote the adopted programmes, projects or activities among the interested Member States and/or in the marine scientific community, as necessary, and make, if appropriate, recommendations to the Sub-Commission to this effect.

(iv) ***Co-ordination***

It shall identify the Member States' institutions, the collaborating organizations, or individuals, as the case may be, participating in the implementation of the adopted programmes, projects or activities and ensure that each such entity is made fully aware of the work it is expected to undertake and how it relates to the work of the other participating entities.

(v) ***Scientific and technical advice and guidance***

- (a) It shall provide advice to the participating entities, as defined above, on appropriate methods, procedures and operations for the optimum implementation of the agreed programmes, projects or activities;
- (b) It shall undertake specific tasks (e.g., prepare scientific and technical reports, reviews, guidelines), if appropriate, to help ensure optimum implementation of the programmes, projects or activities; in particular, the Group of Experts shall keep under review the relationships, if any, between marine pollution and episodic phenomena, such as sudden mortalities of fish and other marine organisms in the region.

(vi) ***Co-operation***

It shall co-operate, as appropriate, with other organisms, such as subsidiary bodies of the Commission or of other international organizations, whether governmental, or non-governmental, global or regional, at an equivalent hierarchical level, as decided by the Sub-Commission for IOCARIBE. In particular, the Group of Experts shall co-operate with the GIMPE Groups of Experts on Effects on Pollutants (GEEP); it shall interact with the Regional Coordinating Unit (RCU) of UNEP for the Caribbean Action Plan (CAP) in the promotion, adoption and co-ordination of those sections of the plan pertinent to the interests of the Sub-Commission.

(vii) ***Reporting***

It shall report to the Sub-Commission at intervals to be decided by the Sub-Commission. In the event that a session of the Working Committee for GIMPE precedes an ordinary session of the Sub-Commission by three months or more, the Group of Experts shall report on its activities to the Working Committee for GIMPE first and the Sub-Commission second.

### **RECOMMENDATION SC-IOCARIBE-II.3**

#### **RECRUITMENT IN TROPICAL COASTAL DEMERSAL COMMUNITIES**

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

*Recalling* Recommendation SC-IOCARIBE-I.2,

*Having examined* the report of the IOC/FAO Workshop on Recruitment in Tropical Coastal Demersal Communities held in Ciudad del Carmen in April 1986, and the report presented to the Sub-Commission by the Chairman of the IOC/FAO Workshop on TRODERP.

*Recognizing* the importance of studying recruitment processes in relation to the assessment of marine fisheries and their fluctuations in space and time,

*Endorses* the recommendations of the IOC/FAO Workshop on TRODERP and the recommendations of the Chairman of the Workshop;

*Recommends* that IOC establish a multidisciplinary regional Group of Experts on OSLR specialized in the field of recruitment processes, in order to guide and advise IOC and FAO on the implementation of the Workshop recommendations, organization of projects and scientific development in general;

*Expresses* its gratitude to the Government of Mexico for the support given to the IOC/FAO Workshop on TRODERP;

*Expresses* its appreciation to the Government of Colombia for its kind offer to host the first meeting of the regional Group of Experts;

*Urges* IOCARIBE Member States to support the regional Group of Experts by providing information relative to the purpose of its work;

*Requests* IOC and FAO to provide the necessary resources to organize the Workshop of the regional Group of Experts and the follow-up of derived activities.

### **RECOMMENDATION SC-IOCARIBE-II.4**

#### **REGIONAL RESPONSE TO MASS FISH MORTALITIES IN THE IOCARIBE OCEAN**

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

*Having recognized* that mass mortalities of marine organisms, including many commercial species, have occurred in the IOCARIBE area with varying frequencies and at local as well as region-wide scales,

*Having further recognized* that such mortalities have deleterious economic effects on the fishing industry as well as having an impact on living community/population structures and their associated ecosystems,

*Noting* that local and regional responses to mass mortalities all too often are haphazard, without scientific or technological capability, and, most frequently, «after-the-fact»,

*Taking further note* of the first action to consider the scientific nature of this phenomenon, the *ad hoc* Symposium on Unusual Mass Fish Mortalities in the Caribbean and Gulf of Mexico, convened at the annual meeting of the Gulf and Caribbean Fisheries Institute in Mayagüez, Puerto Rico, on 20 November 1981, which recommended the formation of an IOCARIBE Steering Committee for the purpose of defining an adequate system of response to future mass mortalities in the region,

**Further recognizing** that the IOCARIBE Secretariat, utilizing funds provided by IOC, convened a meeting of the *ad hoc* Steering Committee in Mayagüez, Puerto Rico, 25-29 October 1982,

**Having studied** the Summary Report of the IOCARIBE *ad hoc* Steering Committee for Developing Regional Contingencies for Fish Kills,

**Endorses**, as a necessary component of the IOCARIBE Programme for OSLR, the recommendations of the *ad hoc* Steering Committee as summarized below:

- (i) preparation of a manual which would provide guidelines, methodology and contingency actions enabling Caribbean countries to respond to future mass mortalities in a timely and scientific manner (cf. Annex III of the respective report);
- (ii) organisation of short courses in order to train the requisite scientific and technical manpower in the recommended activities and procedures in order to respond to mortality phenomena;
- (iii) to develop a reporting format and data centre which, *inter alia*, would provide: a) bi-monthly listings of fish kills, and b) an «early warning system» for fish kills that exceed 100 km<sup>2</sup> in extent;

**Observes with concern** that no follow-up actions have been taken relative to the recommendations of the *ad hoc* Steering Committee by the Commission;

**Requests** the Secretary of IOC to examine the formal establishment of the *ad hoc* Fish Kill Steering Committee as a Group of Experts on Phytoplankton Blooms, Red Tides and Associated Kills of Marine Organisms, including the necessary funds for its operation, possibly with the co-operation of FAO and UNEP, to implement actions recommended in the above-mentioned report,

**Thanks** the Gulf and Caribbean Fisheries Institute for sponsoring the *ad hoc* Symposium in 1981.

#### RECOMMENDATION SC-IOCARIBE-II.5

##### REGIONAL COMPONENT OF THE PROGRAMME ON OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES

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

**Recognizing** the importance of studies related to non-living ocean resources,

**Considering** that important non-living resources exist in the coastal areas of the Caribbean,

**Recognizing** the priority given by the Guiding Group of Experts on OSNLR to the study of coastal processes;

**Bearing in mind**, however, the importance of deep-water studies,

**Endorses** the recommendations of the IOCARIBE Mini-Symposium for the Regional Development of the IOC-UN (OETB) Programme on "Ocean Science in Relation to Non-Living Resources (OSNLR)", Havana, Cuba 4 to 7 December 1986, and **recommends** that the IOCARIBE Secretariat, in particular:

- (i) **Give priority** to studies on beach dynamics and monitoring;
- (ii) **Support** the preparation of seabed topography maps and geomorphological maps of coastal areas;

- (iii) **Support** the organization of regional training courses, workshops and instruction in national institutions, as well as the preparation of relevant manuals;
- (iv) **Support** the establishment of pilot study areas in the IOCARIBE region related to monitoring and protection of coastal areas;
- (v) **Establish** a Group of Experts on Coastal Research for the purpose of assisting IOCARIBE Member States if they so desire;
- (vi) **Support** Quaternary palaeo-oceanographic studies related to sea-level changes;
- (vii) **Support** the development of geophysical research aimed at the study of geotectonic and morpho-structural features in the Caribbean area;
- (viii) **Promote** co-operation between IOCARIBE and the COMAR/COSALC projects with respect to the study of coastal processes.

#### **RECOMMENDATION SC-IOCARIBE-II.6**

##### **DEVELOPMENT OF THE INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE (IODE) SYSTEM IN THE IOCARIBE REGION**

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

**Noting** the present state of development of the International Oceanographic Data Exchange System in the Caribbean region,

**Recognizing** the importance of establishing or strengthening the Oceanographic Data Centre in the Member States of the Sub-Commission,

**Recommends** the institution of a regional course on the organization, structure, operation and needs of human resources and infrastructure for oceanographic data centre;

**Expresses** its gratitude to Colombia for its offer to hold the above-mentioned course in that country;

**Requests** the IOC Secretary to promote the implementation of and obtain the necessary funding for this initiative.

#### **RECOMMENDATION SC-IOCARIBE-II.7**

##### **REGIONAL SYSTEM FOR MARINE INFORMATION MANAGEMENT**

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

**Bearing in mind** the need for a programme of marine information management in the IOCARIBE region,

**Recalling** that the First Session of the Sub-Commission recommended the establishment of an information exchange network (Recommendation SC-IOCARIBE-I/6) under the guidelines given in Annex V of the Summary Report (SC-IOCARIBE-I/3),

**Noting** that the Chairman of IOCARIBE had requested Unesco's funding for a project to set up an information system for IOCARIBE under its Regional Participation Programme,

**Recognizing** the importance of strengthening regional information programmes on marine science to support scientific activities in the region,

**Recognizing** also the importance of such an information system for the IOCARIBE Secretariat's activities,

**Requests** the IOC Secretary to examine financial and other possibilities that would make it possible to organize the above-mentioned information system in the IOC Secretariat for IOCARIBE, ensuring that this initiative ties in with similar systems existing in the region but does not duplicate them.

### **RECOMMENDATION SC-IOCARIBE-II.8**

#### **INTERACTION BETWEEN IOCARIBE AND THE COSALC COMPONENT OF COMAR OF THE DIVISION OF MARINE SCIENCES OF UNESCO**

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

**Recalling** Recommendation SC-IOCARIBE-I.7, Co-operation Between IOCARIBE and Unesco in COMAR,

**Taking into account** that COSALC, the Caribbean and Latin American component of COMAR, and IOCARIBE are developing projects in the coastal area which have common goals and which have high priority in the IOCARIBE region,

**Further taking into account** that, among these common areas of interest, it is both logical and necessary that IOCARIBE and COSALC interact and co-operate so as better to ensure the successful implementation of such activities,

**Recommends**, as an initial step in this direction, that joint activities be concentrated in the area of beach dynamics and management, while bearing in mind that such joint co-operation may be extended to other projects of interest in the future;

**Further recommends** that the requisite TEMA plans and functions take cognizance of the need to prepare human resources in beach dynamics research as well as in beach management, and to take advantage of existing and/or planned specialized courses and also relevant training and educational opportunities identified by IOCARIBE and COMAR/COSALC;

**Recognizes the need** to establish and formalize regular and continuing lines of communication between and within IOCARIBE and COSALC and the complementary projects;

**Requests** the Senior Assistant Secretary for IOCARIBE to take necessary steps to establish the requisite communication and co-operation links with the Unesco Division of Marine Sciences and its COMAR/COSALC projects;

**Further requests** the Senior Assistant Secretary to inform IOCARIBE Member States regarding the development of such co-operation and needed input from IOCARIBE.

ANNEX III

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**ANNEX IV**

**LIST OF DOCUMENTS**

<b><i>Reference</i></b>	<b><i>Title</i></b>
SC-IOCARIBE-II/1	Agenda
SC-IOCARIBE-II/1 Add.	Timetable
SC-IOCARIBE-II/2	Annotated Provisional Agenda
SC-IOCARIBE-II/3	Summary Report
SC-IOCARIBE-II/4	Revised List of Documents
SC-IOCARIBE-II/5	List of Participants
SC-IOCARIBE-II/8 Annex 1	IOCARIBE Regional Component of the Global Sea-Level Observing System (GLOSS)
 <b><i>Information Documents</i></b>	
SC-IOCARIBE-II/Inf.1	Information and Guidelines for Participants
SC-IOCARIBE-II/Inf.2	Intersessional Activities (Report of the Chairman and the IOCARIBE Secretariat)
SC-IOCARIBE-II/Inf.3	Report of the Chairman of the CARIPOL Steering Committee
SC-IOCARIBE-II/Inf.4	Report of the Chairman of the IOC/FAO Workshop on TRODERP
SC-IOCARIBE-II/Inf.5	Western Atlantic Turtle Symposium
SC-IOCARIBE-II/Inf.6	Summary of the Findings of the IOC Expert Mission to the Eastern Caribbean
SC-IOCARIBE-II/Inf.7	Proposal for a Study on the Development of a Regional Network on Higher Education and Research Institutions in the IOCARIBE Region
SC-IOCARIBE-II/Inf.8	Elements of Programme and Budget 86

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**Note:** This list is for reference only as documents are not kept in stock.

ANNEX V

LIST OF ACRONYMS AND ABBREVIATIONS

AGU	American Geophysical Unit
AOML/NOAA	Atlantic Oceanographic and Meteorological Laboratory (NOAA)
CARICOMP	Caribbean Coastal Marine Productivity
CARIPOL	Marine Pollution Monitoring for the Caribbean
CIOH	Centro de Investigaciones Oceanográficas e Hidrográficas
CNES	Centre National d'Etudes Spatiales
COMAR	Unesco Major Interregional Project on Research and Training Leading to the Integrated Management of Coastal Systems
COSALC	Coastal Systems of Latin America and the Caribbean
CPPS	Permanent Commission for the South Pacific
FAO	Food and Agriculture Organization of the United Nations
GEEP	(GIPME) Group of Experts on Effects of Pollutants
GEMSI	Group of Experts on Methods, Standards and Intercalibration
GIPME	Global Investigation of Pollution in the Marine Environment
GLOSS	Global Sea-Level Observing System
IAEA	International Atomic Energy Agency
IBCCA	International Bathymetric Chart of the Caribbean Sea
IGOSS	Integrated Global Ocean Station System
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IODE	International Oceanographic Data Exchange
JOA	Joint Oceanographic Assembly
MARPOLMON	Marine Pollution Monitoring Programme
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
NODC	National Oceanographic Data Centre
OOSDP	Ocean Observing System Development Programme
OSLR	Ocean Science in Relation to Living Resources
OSNLR	Ocean Science in Relation to Non-Living Resources
POCCAR	IOCARIBE Programme in Physical Oceanography and Climate
RNODC	Responsible National Oceanographic Data Centre
SETMY	Sea-Level Environment and Tectonics during the Last Million Years
TEMA	Training, Education and Mutual Assistance in the Marine Sciences
TOGA	Tropical Oceans and Global Atmosphere
TOPEX	Topography Experiment (US Altimetric Experiment)
TRODERP	Tropical Demersal Recruitment Project
UNAM	Universidad Nacional Autónoma de México
UNEP	United Nations Environment Programme
UNICA	Association of Universities of the Caribbean
UN(OETB)	United Nations Ocean Economics and Technology Branch
WATS-II	Second Western Atlantic Turtle Symposium
WCRP	World Climate Research Programme
WOCE	World Ocean Circulation Experiment