

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

**IOC Scientific Committee
for the Global Investigation
of Pollution
in the Marine Environment**

Sixth Session

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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

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1. OPENING

Dr Neil Andersen, Chairman of the Committee, called the Session to order at 10.00 on 25 September 1986. 1

The Secretary of IOC, Dr Mario Ruivo, welcomed the participants. He noted the considerable progress since the formation of the Committee in 1972. This was the result of several factors: there was the increasing awareness by Member States of the importance of GIPME, the devoted work of the Officers of the Committee and of its subsidiary bodies, and the dedicated involvement of the national experts concerned, as well as the efforts of colleagues in the Secretariat. 2

Another element in the consolidation of the programme is to ensure that IOC regional bodies implement effectively the regional components of GIPME/MARPOLMON and that they are adequately co-ordinated with other regional bodies working in complementary fields, or which, because of their mandates, are users of information and data for management and protection purposes. This development should be carried out in close collaboration with UN organizations and other bodies that are co-operating with the Commission. With these developments the IOC can contribute effectively to the assessment of the state of the health of the marine environment; this is a major task of UNEP with which IOC is closely associated. However, unless we succeed in developing the required regional data bases and regional assessments, the evaluation at a global level would present gaps and deficiencies. This would appear to be one of the major tasks of the Committee. 3

Nevertheless, human and financial resources at this historical moment are limited for everybody - for the Member States, including the most developed and industrialized countries and obviously, for international organizations and the Committee should try to provide guidance on optimizing these efforts so as to avoid duplication and to create new arrangements so that the competence of different organizations could be pooled for the common good. There are too many bodies at the national level, so there is a need for concerted action at this level; otherwise, the international organizations will reflect the diversity and sometimes contradictory views that are expressed by different national constituencies. 4

There is still a need to broaden and create new arrangements with other organizations. IOC has invited UNEP to consider, in due course and based on achievements, the possibility of having GIPME as a joint programme, and the progress in this direction is encouraging. 5

Some lessons can be drawn from the GIPME venture in the last thirteen years. The first is that a programme requires time to attain maturity; ten years in international affairs is nothing. The second is that a well established Plan of Action can help a lot in streamlining and defining the priorities. However, the Plan should be submitted to periodic reviews to meet the needs of Member States and those of international organizations having environmental management responsibilities, and co-operating with the Commission. 6

7 The third is that the Committee has achieved credibility by pursuing quality; and having credibility, useful contributions from Member States to the IOC Trust Fund, or support in kind can be negotiated. Much of this quality is due to the scientific and technical experts who participate, often with great sacrifice of time and effort, in the work of the Committee.

8 Finally, there is a vital need to ensure that developing countries at all levels of development are associated with the Committee's work. The Member States represented here are still a small fraction from the world community of nations. The absence of Delegations reflects economic difficulties, and sometimes weaknesses at national level in terms of national infrastructure and capabilities. Therefore, a special effort is needed in training, education, mutual assistance, as well as in service activities, such as data exchange in which new problems are emerging, so that all Member States can participate in an effective manner in this collective effort. The success of GIPME, like that of IOC, is the result of the political will and the willingness of Member States to achieve, collectively, a goal of interest to them.

9 Organizations concerned must make an effort to work together, and there is a special role for regional organizations of which the CPPS is a particularly good example in which relations with IOC are of mutual benefit.

10 The Chairman responded to Dr Ruivo's welcome and Opening Address, expressing the hope that the results of the Session would meet with expectations. He also noted that the Agenda before the Committee and the associated workload were very considerable, so that it was necessary to keep to the timetable, while, at the same time, giving thorough consideration to each Item. The Session was declared opened.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

11 The Committee adopted the Provisional Agenda of the Session as circulated (Document IOC/WC-GIPME-VI/1), presented as Annex I of this Report.

2.2 DESIGNATION OF RAPPORTEUR

12 Following the nomination by Canada, USA, Germany, (Federal Republic of) and France, the Committee designated Dr Manuwadi Hungspreugs (Thailand) as Rapporteur of the Session.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

The Technical Secretary for the Session introduced the Provisional Timetable and indicated revisions required, in order to facilitate adequate discussion of some Items. Following suggestions from some Delegations, the provisional Timetable was accordingly revised. 13

The Session should normally be conducted in Plenary, but ad hoc Sessional Drafting Groups could be established if required. 14

3. INTERSESSIONAL ACTIVITIES

The Technical Secretary introduced Document IOC/WC-GIPME-VI/6 "Report on Interseasonal Activities in the Field of Marine Pollution Research and Monitoring". 15

He reviewed the progress made during the interseasonal period and gave an account of initiatives taken through the Officers of the Programme, through the Group of Experts on Methods Standards and Intercalibration (GEMSI) and the Group of Experts on Effects of Pollutants (GEEP). Both Groups had carried out several activities, including development of methods, intercomparison exercises covering many regions, practical workshops addressing specific subjects and training activities. Two papers have been published describing GIPME and the state of its development, in the Marine Pollution Bulletin Vol. 17, No. 8, 1986 and the Marine Technology Society Journal, Vol. 20, No. 1, 1986. 16

Regional activities have been carried out extensively through the IOC Regional Subsidiary Bodies and in co-operation with other regional Organizations, and UNEP. 17

Co-operation with International Organizations is showing a clearly increasing trend, both at regional and global level. Particularly noticeable is the considerable strengthening of the interaction and co-operation which is in progress with UNEP and its Oceans and Coastal Areas Programme Activity Centre (OCA/PAC), with IMO, with IAEA, with CPPS, and with ICES. 18

The Chairman expressed his thanks for the review of interseasonal activities which he said were quite considerable, and emphasized the problem of manpower in the Secretariat and the Committee expressed its appreciation to the Technical Secretary, Dr Kullenberg, for his considerable efforts. 19

In a general discussion of the progress of the GIPME programme, the Delegate from Canada felt that the Symposium on Status and Trends in the Development of the GIPME Programme had indicated that the problems in the immediate coastal zones of Member States were difficult to relate to many aspects of the Comprehensive Plan for GIPME (IOC Technical Series No. 14, 1976), e.g., the studies of transport and fluxes in the deep ocean. These pragmatic concerns should perhaps be amalgamated into the scientific concepts of the programme. 20

21 The Committee took note of these remarks and endorsed them.

22 The Committee accepted the Report on Intersessional Activities.

23 The Committee agreed to deal with specific Items in the Report of intersessional activities under the appropriate Agenda Item.

4. THE ROLE OF GIPME IN GLOBAL STUDIES

24 The Vice-Chairman, Dr. R. Chesselet, introduced this Agenda Item, referring to Documents IOC/WC-GIPME-VI/7 and IOC/WC-GIPME-VI/8, paragraphs 8-16 and Annex 2, and also IOC/GOPPS-III/3S, section 4.4.

25 He pointed out that a number of emerging research programmes, such as the International Geosphere - Biosphere Project (IGBP) and the Global Ocean Flux Study (GOFS), refer to the environment as integrated, emphasizing interactions between the land, the sea and the atmosphere, long-range transport of various substances and contaminants and their cycling through geo- and bio-geochemical processes, and associated global fluxes. Recent evidence shows that changes in such cycles and fluxes on a global scale due to human interferences, can be considerable. The Vice Chairman reiterated the statement of the Officers of the Programme (Document/GOPPS-III/3S) that with regard to pollution problems in general, focus was now placed on understanding processes driving the various cycles of elements and energy in the ocean, and the ocean-atmosphere-land-sediment interactions.

26 The Committee considered the potential interaction between the climate research programmes and research programmes addressing the cycling and fluxes of elements. In particular, the Committee noted the possibility of close co-operation between the World Ocean Circulation Experiment (WOCE) and the emerging Global Ocean Flux Study (GOFS), as well as the possible role of the joint SCOR/IOC Committee on Climate Changes and the Ocean (CCCC).

27 The Committee recalled that GIPME and its subsidiary bodies provide a global mechanism for the co-ordination of associated marine chemistry studies relevant to an assessment of the contamination and the state of health of the marine environment. In this respect, the Committee recommended a close interaction with CCCC in order to provide the oversight and co-ordination needed for the intergovernmental aspects of GOFS. The Committee agreed that it and its subsidiary Groups of Experts, had the necessary scientific expertise and the necessary governmental representation to serve such a function. This would facilitate achievement of: (i) use of chemical tracers, including contaminants for studying physical processes, (ii) use of the physical oceanography data for interpretation of flux studies, and (iii) use of the process-oriented studies to interpret and assess possible effects of pollution (i.e., relating results from state-of-the-art research on global ocean programmes to pollution oriented studies).

28 The Committee noted that the CO₂ problem and the global carbon cycle, form important elements of climate and flux studies, and they are being adequately covered in other fora. However, the Committee also noted that the pollution-oriented studies may provide valuable information on gaps in the global CO₂ mass balance, in particular, in

relation to the possible role of the coastal zone and shelf sea areas in production and changes thereof, due to eutrophication.

The Committee agreed that this was an important aspect to develop in the GIPME Programme, but one that would be difficult, and should be done carefully. Therefore the Officers of GIPME, working with the Secretariat, were requested to study the issue of more effectively associating the Programme with the previously noted emerging global ocean programmes and report developments and recommendations to the next Session of the IOC Assembly (Paris, March 1987). CCCO should be invited to collaborate in the Study. 29

The Committee stressed the importance of taking into account experiences in other programmes of the IOC relating to global ocean programmes and noted that the CCCO officers at their meeting in Beijing, (August 1986), had requested the Secretary CCCO to arrange an assessment of: (i) the relevance of the emerging bio-geochemical programmes such as IGBP and GOFS to experiments addressing the oceans role in climate, eg. TOGA and WOCE, and (ii) how coordination between such programmes and CCCO should be carried out. 30

5. THE GLOBAL MARINE POLLUTION MONITORING SYSTEM (MARPOLMON)

5.1 METHODOLOGICAL DEVELOPMENTS

The Chairman of the Group of Experts on Methods, Standards and Intercalibration (GEMSI), Dr J.C. Duinker, described the responsibility of that Group for developing methods to be used in activities of the GIPME Programme particularly MARPOLMON, as well as for serving the needs of the UNEP Oceans and Coastal Areas Programme. The methods are developed on a scientific basis; they must be reliable and applicable, as tested in training and intercomparison exercises and workshops. 31

The activities have resulted in the updating of Manuals on: 32

- (i) the analysis of dissolved and dispersed hydrocarbons in seawater by UV-fluorescence (IOC Manuals and Guides No. 13) and
- (ii) the analyses of organochlorine compounds by packed column GC-ECD (UNEP Regional Seas/Reference Method No. 14).

Further, new Manuals were formulated on (i) trace metals in river water, (ii) organochlorine compounds by capillary column GC-ECD, (iii) basic chemical parameters in seawater and (iv) basic oceanographic and meteorological parameters (all within the UNEP Regional Seas Reference Method Series). Finally, the following methods are in various stages of development; for trace metals in suspended matter, for trace metals in sediments, for hydrocarbons by GC-MS, for photochemical products of hydrocarbons, for organochlorines in seawater and for input of contaminants from the atmosphere. 33

34 An Observer stressed the need for the development of methods for the analysis of new chemical contaminants, such as toxaphene, in order to avoid a situation whereby the appropriate method is not available whenever required in the future. He also stressed that the use of DDT and PCB has been decreased or banned in many countries, while the use of toxaphene has been increased.

35 The Committee noted that the presence of many yet unidentified chemicals has been observed in various marine compartments. As long as such compounds have not been identified (and no appropriate reference materials are available, such as in the case of the complex mixture in toxaphene), no reliable methods can be recommended. It was noted that the reduction in the use of DDT is restricted to some areas and further, a considerable fraction of the total production of PCB will be present in the marine environment for many years to come.

36 The Committee therefore endorsed the continuation of the method development for these contaminants, which, in addition, play an important role as model compounds for other (new) contaminants.

37 The Committee agreed that the methods to measure individual organic contaminants is still in the research and development stage. Work carried out intersessionally by individual laboratories has resulted in considerable improvement in contamination control and analytical procedures.

38 The development of appropriate methods for measuring selected organic contaminants as a prerequisite to the conduct of an open-ocean baseline has been attributed first priority by WC/GIPME-V as reiterated by GOPPS-III and recommended formally by GEMSI-VII. The Committee agreed on this prioritization.

39 The Chairman of GEMSI then introduced the proposal for follow-up work to meet these requirements. Thorough testing and intercomparison is necessary of the effectiveness of techniques that are used to pre-concentrate the analytes from large volumes of seawater. The Committee agreed that a workshop should be organized, preferably late 1987 or 1988, involving scientists with sufficient experience in the essential steps of the procedures involved in sampling of seawater and the determination of organochlorines therein. The site of the Workshop should be close to an homogeneous open-ocean water mass and should offer appropriate analytical and "clean-room" facilities.

40 The Delegate of the US called the Committee's attention to the fact that individual scientists are being supported at a number of institutions to conduct research which is of direct relevance to the GIPME Program. One such effort, having an annual level of effort of 200,000 US\$, will soon be initiated and having direct bearing on the work that has been proposed by GEMSI.

41 The need for simple methods and detailed manuals, including a detailed scientific discussion, was stressed by several Delegations and this view was generally endorsed by the Committee. It was realized that the methods should be designed so as to meet the objectives of the users. It should be clearly defined as to what the data obtained will be used for. Thus, methods of different levels of sophistication may be required. A simpler method may be used for screening purposes (e.g., by

using the UV-fluorescence technique for dissolved/dispersed petroleum hydrocabons in seawater) or for trend analysis (e.g., the packed column GC-ECD technique for PCB's in a selected matrix). More sophisticated methods (capillary GC-ECD or GC-MS methods) are required for detailed information on important properties like sources, sinks, transport or transformation processes and effects on organisms. Similarly alternative methods for low and high levels of trace metals in different matrices are used.

One Delegation noted that the different aims of the UNEP-Oceans and Coastal Areas Programme and GIPME may result in different needs. It was also noted that analytical procedures for several types of contaminants are necessarily of a complicated nature, and that many laboratories in developing countries may well be able to perform the more complicated analysis provided the necessary equipment is supplied and facilities are available for its maintenance.

42

The Chairman of GEMSI asked the Committee for guidance on selection of parameters to be considered in the programme, as well as on the level of sophistication required, in order to develop the best applicable methods and manuals, meeting regional requirements. The sessional ad hoc group established to address this subject concluded that there is a range of objectives for which specific methods are required (Annex 4); the determination of general incidence of contaminants to the collection of data for regional and global comparisons and mass balance calculations. The methods and alternatives must be adjusted accordingly. Descriptions of techniques should be comprehensive including a thorough explanation of the scientific basis for the techniques.

43

The Committee endorsed the approach and instructed GEMSI to develop the matter further in consultation and co-operation with relevant Regional Bodies.

44

5.2 REFERENCE MATERIALS FOR USE IN MARINE POLLUTION STUDIES AND CHEMICAL OCEANOGRAPHY

The Chairman of GEMSI recalled the development of the subject matter within the framework of GEMSI (Document IOC/GGE(MSI)-VI/3), and invited the Chairman of the GEMSI ad hoc Group on Reference Materials to present the development.

45

The Chairman of the ad hoc Group, Dr A. Walton, reviewed the various developments leading up to the decision of the Executive Council at its Nineteenth Session, (6 to 12 March 1986) to create a Group of Experts on Standard Reference Materials for Marine Pollution and Chemistry, and to invite UNEP, IAEA and ICES to co-sponsor its work (Document IOC/EC-XIX/3, section 4.3 and Resolution 2). The GEMSI ad hoc Group, at a meeting held in Washington, D.C., (October 1985), brought together most of the key producers of standards and reference materials, e.g., National Institute of Environmental Studies (Japan)*, National Bureau of Standards (USA), National Research Council (Canada), National Oceanographic and Atmospheric Administration (USA), United States Geological Survey, U.S. Environmental Protection Agency, Bureau of Common Reference Materials (European Community)* and the Institute of Oceanographic Sciences (United Kingdom)*.

46

* Not present at meeting but participated through correspondence.

- 47 The reactions of the producers of reference materials to suggestions that international efforts in this field might be co-ordinated in the interest of economy and scientific necessity were positive. An offer from NOAA (USA) to assemble a catalogue of current reference materials was proposed and accepted by the ad hoc Group. Some producers indicated their willingness to undertake preparations of specific materials on a relatively regular basis. Others agreed to augment their production to satisfy expanded needs. Resources for these activities would, of course, have to be forthcoming. The ad hoc Group also felt that quantitative expressions of the needs of the marine community must be produced prior to further deliberations.
- 48 The Technical Secretary described the actions taken since the Nineteenth Session of the Executive Council. He stated that IAEA had formally agreed to co-sponsorship and that UNEP were presently considering the formal agreement. ICES will make their decision after the Statutory Meeting in October this year. All of the producers invited to participate in the work of the Group had, with only one exception, responded positively and are prepared to work in co-operation with the Group of Experts. The Reference Materials Committee of the International Standards Organization (REMCO-ISO) has indicated a positive interest and suggested that the proposed Group of Experts could gain benefit from their experiences.
- 49 The Committee noted that the activity is not deemed as one in competition with producers' interests but rather one of co-ordination to ensure that scientists in the various regions have materials available to them on a continuous basis.
- 50 The Delegate of US reported that the catalogue "Standard and Reference Materials for use in Marine Science" has been completed by NOAA. The catalogue lists relevant material now available from nine organizations. A description is given of the origin of the material, the concentration of each analyte, and the procedure for ordering the material. A copy of the catalogue may be obtained free of charge by writing to Dr. John Calder, NOAA, Ocean Assessments Division, N/OMS32, Rockville, Maryland, 20852, USA.
- 51 The Chairman expressed his gratitude on behalf of the Committee for the efforts made by NOAA and the individual staff member, Dr Adriana Cantillo, in producing this valuable Catalogue.
- 52 The Committee discussed the proposed Terms of Reference for the new Group of Experts on Standards and Reference Materials.
- 53 The Representative of UNEP expressed his concern as regards the new Group of Experts planning the long-term development of Reference Materials and suggested that GEMSI was the most appropriate body to put this in context with the development of reference methods and the need for materials to support the methods and intercalibration exercises.
- 54 The Chairman of the GEMSI ad hoc group on Reference Materials pointed out that a close link with GEMSI was implicit but the Group would be obliged to undertake its long-term planning in concert with its sponsors. He suggested that UNEP co-sponsor the Group and hence dispel this concern.

Alternative formulations were proposed in order to resolve the concerns expressed during the discussion. 55

The Committee adopted the Terms of Reference (Annex V) for consideration and approval by the Fourteenth Session of the IOC Assembly. 56

The Representative of UNEP questioned whether the Terms of Reference of GEMSI required modifying to release the Group of Experts on Methods, Standards and Intercalibration from their responsibility in regard to standards. 57

The Committee agreed, however, that the responsibility for "Standards" in GEMSI embodied a wider meaning of responsibility, for standards in development of methods, quality assurance and proper use of standards and reference materials and that this remains valid. 58

The Representative of UNEP announced that UNEP would co-sponsor the Group of Experts on Standards and Reference Materials. 59

The Chairman of the former ad hoc Group of GEMSI was invited to assume the position of Chairman designate of the Group of Experts on Standards and Reference Materials for the first meeting, during which its Chairman would be elected. 60

5.3 INTERCALIBRATION AND INTERCOMPARISON EXERCISES

Dr R. Dawson, an Observer on the US Delegation, introduced the Agenda Item, noting that the individual intercalibration exercises and workshops will also be discussed under Agenda Item 5.6, Regional Activities. Additionally, many of these exercises have been described in workshop reports and contributions to the reviewed scientific literature. Further details will be provided in the report of the Symposium on Status and Trends in the development of the GIPME Programme which preceded this Session. 61

GEMSI has provided advice on the conduct of a number of intercalibration exercises, either singly under the IOC-GIPME Programme but more commonly in concert with ICES, UNEP or IAEA and National Agencies (Document IOC/WC-GIPME-VI/6). 62

These intercalibration exercises fall into two broad categories: those through which intercalibration samples are sent to laboratories to be analyzed and those which are workshop intercalibrations where participants are brought together to carry out the analyses. The findings and scientific conclusions of the Caribbean-CARIPOL Intercalibration on Petroleum Hydrocarbons exercise (Bermuda 1984) were published in the Marine Pollution Bulletin., vol. 17, No.7, 1986. The results support the conclusions of the CARIPOL Programme, that beach tar surveys are extremely valuable indicators of petroleum contamination and that these measurements can be scientifically interpreted in the context of oceanographic processes (i.e., currents, winds, gyres, etc.) and maritime activities. 63

- 64 Follow-up activities in the Mediterranean and the Caribbean Regions are underway to intercalibrate gas chromatographic techniques for the determination of petroleum hydrocarbons in matrices of marine origin.
- 65 Agreements reached between IOC and UNEP have resulted in a second round trace metal in biota intercalibration with materials being distributed by IAEA/ILMR to a large number of laboratories. A training workshop conducted at the University of Papua New Guinea this year involved participants from three Pacific Programmes: the South Pacific and the East Asian Seas Action Plans and WESTPAC.
- 66 An IOC intercalibration workshop conducted at Chulalongkorn University, Bangkok, Thailand (April-May 1986), with participants from WESTPAC, was the first of its kind to intercalibrate methods for the sampling and analysis of river water and suspended particulate matter for trace metals and petroleum hydrocarbons.
- 67 The Committee noted that exercises involving the preparation of uncompromised intercalibration materials are extremely expensive and require large commitments of facilities and human resources. This has been appropriately addressed in the report of the ICES/IOC/NOAA/UNEP Intercalibration Exercise on Petroleum Hydrocarbons in Biota, presented at the GIPME Symposium preceding this Session, and was extensively discussed there (Document IOC/WC-GIPME-VI/13).
- 68 The Committee agreed that much attention must be given to the high demand for materials and the co-ordination of an expanding number of exercises, as the various monitoring programmes mature in the different regions.
- 69 In addition, the Committee agreed that appropriate attention should be paid to possible mechanisms for an evaluation of the intercalibration exercises and workshops in the context of the Comprehensive Plan for GIPME (IOC Technical Series 14, 1976), and its implementation (IOC Technical Series 25, 1984).
- 70 The Committee noted that much progress had been made in developing, testing and writing reference methods, detailing sampling protocols and sample presentation technique. These had been intercalibrated and intercompared, and training both in the group sense and on an individual basis had been carried out in many regions.
- 71 The Committee recommended that GEMSI carries out a critical review of the effectiveness of intercalibrations and workshops and presents it to the Committee and the co-sponsors of GEMSI.
- 72 The Chairman indicated that evaluations of experts involved with the regional programmes should be included in this assessment and thanked the Chairman of GEMSI for his willingness to take on the task.

5.4 WORKSHOPS AND SYMPOSIA

- 73 The Committee noted under Item 5.3 that many Workshops fall under the category of intercalibration exercises, whereas other workshops and symposia are integral components of Regional activities and are discussed under the appropriate Agenda Item.

An example is the First Workshop of Participants in the Joint 74
FAO/IOC/WHO/IAEA/UNEP Project on Monitoring of Pollution in the Marine
Environment of the West and Central African Region (WACAF/2 - Pilot
Phase), Dakar, 28 October - 1 November 1985.

The IOC Workshop on Biological Effects Measurements, Oslo, 11-29 75
August 1986 was discussed under Agenda Item 6.

The IOC Symposium on Status and Trends in the Development of the 76
GIPME Programme, Paris, 22-24 September 1986 (Document IOC/WC-GIPME-VI/13)
was considered under Agenda Item 5.6, as well as referred to under other
Agenda Items.

The Committee agreed that Workshops, Symposia and 77
Intercalibration exercises generally should be tied to defined
programmatic activities or long-term goals, and that they were an
essential element in securing exchange of information between global and
regional activities, and transfer of results from the GIPME Groups of
Experts to regional activities. The Committee agreed that they constitute
an essential mechanism for maintaining a dialogue between participants in
the Programme Activities and the transfer of experiences.

The Committee concluded that involvement of the Groups of Experts 78
as an advisory component in these activities should continue and be
maintained.

5.5 INTEGRATED GLOBAL OCEAN MONITORING (IGOM)

The Chairman referred to Documents IOC/WC-GIPME-VI/6, section 79
2.3, and IOC/WC-GIPME-VI/8, paragraphs 45-46, the discussion at the XVI
Session of GESAMP (London 17-21 March 1986) and the request of GESAMP for
comments from the Committee. He then called on the Chairman of the
GESAMP Working Group, Dr. (Mrs) A. Tsyban, to introduce the Agenda Item.

Dr. Tsyban referred to the report of GESAMP Working Group No.24 80
on Integrated Global Ocean Monitoring which had been made available, and
elaborated on selected parts and informed the Committee that the Second
Meeting of the Working Group would be held in Moscow in November 1986.
The Sixteenth Session of GESAMP had agreed that the Chairman of the
Committee should be invited to participate.

The Chairman thanked Dr. Tsyban for her presentation and invited 81
the Chairman of GESAMP, Dr. (Mrs.) G. Howells who informed the Committee
about the discussions of the last session of GESAMP.

The GESAMP Working Group on IGOM was commissioned "To examine 82
the scientific basis, rationale, feasibility and the technical
requirement for monitoring biological and chemical conditions and the
ecological consequences of pollution, i.e., the scientific justification
for an integrated global ocean (by which is meant all sea areas)
monitoring study (IGOM) related to marine pollution and the ecological
consequences thereof, taking into account what is already being done in
these fields", (Report of the Fourteenth Session held at IAEA
Headquarters, Vienna, Austria, 26-30 March 1984, Report and Studies
GESAMP No. 21). Any operational programme that might develop from its
considerations would have to be carried out through an international

organization, e.g., IOC through the GIPME Programme. It was made clear by the UNEP Representative that it was not GESAMP's intention to establish a monitoring programme.

83 The Chairman noted that through the activities of the Group of Experts on Effects of Pollutants (GEEP), a capability is being developed to deal with biological and ecological aspects of marine pollution research and monitoring. This would answer one need identified in the IGOM context.

84 The Committee decided to charge an ad hoc Sessional Group with the identification of the possible role of GIPME in the context of IGOM.

85 Following consideration of the circulated documents and presentations, as well as discussions by an ad hoc Sessional Group, the Committee pointed out that the GESAMP Working Group on IGOM had interpreted its Terms of Reference very broadly to include two stages, the first being research oriented, and the second being directed to monitoring. While the broad scope of the initial approach was appreciated, the Committee recognized that a more focussed effort is now needed. For the first stage, consideration should be given to reviewing current understanding of ocean processes and techniques for sampling (e.g., remote sensing) and assessment of these techniques so as to identify research needed to improve the Integrated Global Monitoring system. For the second, a strategy should be formulated so as to lead logically to a feasible monitoring programme.

86 The Committee considered that the development of a monitoring strategy will require precise definition of the aims and purpose of the monitoring programme and identification of its target(s). The scope, timescale and appropriate methods for specific components of a global ocean monitoring programme should be specified, together with possible mechanisms for co-ordination and collaboration with existing programmes, for instance, those regional and other activities that fall within the scope of the GIPME Programme. In particular, the implementation of any monitoring plan would fall to an organization, such as IOC and its GIPME Programme, whose advice on the feasibility and value of the monitoring programme will be essential. To encourage the convergence of the GIPME and IGOM objectives on Global Ocean Monitoring, the Committee accepted the invitation from GESAMP to send a representative from GIPME to future meetings of Working Group No. 24. The IGOM Working Group should also be asked to consider the GIPME Programme Strategy outlines in IOC Technical Series Nos. 14 and 25 in developing an approach to Global Ocean Monitoring.

87 The Chairman extended the appreciation of the Committee to the Sessional ad hoc group and its chairman (Dr. Calder) and to GESAMP for the invitation to assist the GESAMP Working Group No. 24 in its work. He emphasized that the task of WG. No. 24 was to assess the scientific justification and feasibility of integrated global ocean monitoring.

88 The Chairman pointed out that a number of aspects of the Integrated Global Ocean Monitoring, particularly oceanic productivity and the observation of chlorophyll-like pigments using space borne sensors, (although not yet in operation), are integral components of the global ocean programmes, especially GOFs, referred to in Agenda Item 4. He

suggested that the Chairmen of GEMSI and GEEP took appropriate steps to associate their relevant and co-operative activities with GOFs. In making a summation of this Agenda Item, the Chairman noted that from a conceptual viewpoint, IGOM, in addressing the many aspects that are proposed in a global perspective, matches in many ways the objectives of a World Ocean Watch which the IOC plans to develop. When this becomes a reality, this programme could provide a framework for conducting open ocean studies, other than baselines, and would include ongoing monitoring systems and activities, such as IGOS, for selected physical parameters (e.g., temperature and salinity), GLOSS (e.g., for sea level), MARPOLMON (e.g., for pollutants), GEEP (e.g., for biological effects).

The Committee took due note of the Chairman's comments and endorsed the proposal to have an expert, identified by IOC and familiar with the GIPME Programme, to contribute to the deliberations of GESAMP Working Group No. 24. Further, the Committee also endorsed the Chairman's suggestion to have the Chairmen of GEMSI and GEEP begin developing ways in which to interact with GOFs, and any other global ocean monitoring programme relevant to GIPME, and take any follow-up action deemed appropriate to reach this goal.

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The Committee also recommended that IOC consider the desirability of a study on the feasibility of a pilot project to monitor ocean productivity, particularly plankton blooms. This should be undertaken by IOC-FAO Guiding Group of Experts on Ocean Science in Relation to Living Resources (OSLR), jointly with GIPME, and an expert consultation be organized by IOC to that effect.

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5.6 REGIONAL ACTIVITIES

The Chairman gave an overall introduction to this Agenda Item, referring to Documents IOC/WC-GIPME-VI/6 and IOC/WC-GIPME-VI/8 as well as to reports available on activities in specific regions, namely the report of the First Meeting of the Western Pacific (WESTPAC) Task Team on Marine Pollution Research and Monitoring, (Townsville, Australia, 17-19 April, 1985) and to the Report of the Fifth Meeting of the IOCARIBE/CARIPOL Steering Committee, (Puerto Rico, 7-9 December, 1985).

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The Chairman also referred to the IOC Symposium on Status and Trends in the Development of the GIPME Programme (Document IOC/WC-GIPME-VI/13). In the Report an overview table is included, showing in a simplified matrix, activities which have been carried out or which are in progress and planned for several regions of the world. This table represents an update since the Second Session of the Committee (Paris, 14-20 September 1977, Document IOC/WC-GIPME-II/3, Section 3), and demonstrates the very considerable increase of activities which has occurred over the past decade. The overview table with comments will be published as an addendum to this Report under the title "Overview Presentation of Regional Activities" (Doc. IOC/WC-GIPME-VI/3 Suppl.).

92

The Chairman further noted that during the Symposium, presentations of regional activities had shown that monitoring activities using sentinel organisms (e.g. mussels) were either in progress, or in an advanced state of planning, for implementation through regional networks. He therefore considered it appropriate to start the Agenda

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Item with a presentation and discussion of a proposal for a global musselwatch, which could spur the interest of many of the regional programmes. A number of discussions in national, regional and international scientific fora had pointed to the desirability of conducting a global musselwatch in the broadest context.

94 The proposal focuses on a reasonable objective of a global musselwatch in the hope that this would have a catalytic effect on future approaches.

95 The proposal was presented on behalf of a number of experts involved in its generation. In particular, the support of Professor E. Goldberg, Scripps Institution of Oceanography and Dr E. Schneider, Chesapeake Biological Laboratory, was acknowledged for the first drafts and the assistance of the GIPME Symposium participants in developing this further through their comments, discussions and support was acknowledged. The proposal as reviewed appears as Annex VI.

96 The Chairman urged the Committee to support and endorse this proposal.

97 Several Delegations and Observers expressed their support for the proposal, noting, inter alia, that: the comparative approach (Northern and Southern Hemisphere) will produce valuable data for the scientific community; that the paucity of measurements in southerly locations may be failing to accurately characterize the situation in those locations; that musselwatch activities should be developed quickly, along with standards and reference materials; that it would be appropriate to co-ordinate with existing programmes; that the financial implications should be considered; that preparations for musselwatch programmes are being made in many areas, and that surveys of use and production of organochlorine pesticides have been made; that it would be a major international achievement if this proposed activity was indeed mounted and not just planned; that large scale analytical/scientific benefits for all participating scientists could result; that the results could be major inputs to the Review of the State of the Health of the Oceans; that archiving of samples, if properly maintained, would be an enormous resource for the future monitoring efforts of GIPME.

98 The Representative of UNEP indicated the interest of his organization to support the proposed "musselwatch", concentrating on organochlorines in the the southern hemisphere, as part of UNEP's Global Environment Monitoring Systems (GEMS) and implemented through IOC/GIPME. UNEP would be ready to:

- include "musselwatch" in ongoing UNEP-supported regional programmes;
- put at the disposal of "mussel watch" the facilities of the UNEP-operated Global Resource Inventory Database (GRID) as the central data repository and processing facility of the "musselwatch";
- support IAEA/ILMR as the central analytical and data quality control mechanism for the "musselwatch".

After discussion of the merits of mounting an international "Musselwatch" programme, the Committee agreed that such a programme would: 99

(i) link regional activities in this field;

(ii) provide an input to the international review of the state of the marine environment and an input to the commitment of GESAMP to provide periodic reviews of the State of the Health of the Oceans;

(iii) provide a baseline against which to compare future assessments;

The Committee noted that such a programme had been recommended by major international scientific meetings, e.g., the First International Symposium on Integrated Global Ocean Monitoring, Tallin, 1983, and Musselwatch II, Hawaii, 1983. 100

The Committee considered that an appropriate ad hoc Group of Experts, in association with GEMSI, should further design a strategy for the most efficient conduct of the project. 101

The Committee considered that an appropriate ad hoc Group of Experts, in association with GEMSI and GEEP, should further design a strategy for the most efficient conduct of the project. 102

The Committee adopted Recommendation SC-GIPME-VI.1. 103

5.6.1 Open Ocean Baseline Studies

The Chairman recalled that the Open Ocean Baseline Study is a major component of the Comprehensive Plan for GIPME (IOC Technical Series No. 14, 1976), and that the Programme is fully committed to the implementation of such a Study when it is deemed to be scientifically viable. 104

The Delegate of Canada introduced the design developed through GEMSI of an open ocean baseline study for trace metals. GEMSI had first considered a deep ocean baseline proposal in 1980 but had not proceeded further with its design until after GIPME-V (Bangkok, 30 July - 3 August 1984), where it had been decided to proceed with the baseline study even if it could only be carried out for trace metals. An ad hoc group of GEMSI had been formed at GEMSI-VI (Woods Hole, USA, 26-30 November 1984) to develop a proposal and design for such a baseline study. This ad hoc group had reported to GEMSI-VII (Monaco, November 1985) with the proposal provided by IOC/WC-GIPME-VI/12. GEMSI-VII had amended this proposal and agreed to a revised version that had been sent out for review among the marine geochemical and physical oceanographic community. These reviews had, in the main, been very positive about the design and usefulness of a deep ocean baseline study. 105

The baseline design, as approved by GEMSI-VII comprises two components. The first of these involved the acquisition of data on the trace metal composition of major deep ocean masses of the North Atlantic, with emphasis on such compositions near to their source regions. For this reason, the network of deep ocean stations chosen includes sites in both the North and South Atlantic. Stations have been chosen to permit 106

the collection of several samples from all the major deep water masses near to their origins or formation areas. This component has been designed to provide information on the heterogeneity of trace metal compositions of deep water to determine if compositional signals related to physical oceanographic conditions can be discovered. There is currently inadequate scientific coverage of the oceans in respect of the incidence of trace constituents and this component of the baseline study will provide valuable information in both an environmental and oceanographic context.

107

The second component involved the characterization of metal distributions and variability on transects from coastal regions into the deep ocean basin of the Atlantic in a number of areas. Collection of data on the metal distributions in these sections, in relation to various physical and biological oceanographic parameters, will provide not only information on the character of net influxes to the ocean and its heterogeneity, but also offer the possibility of providing a baseline for more rapid temporal changes in the ocean than those likely to take place in deep water. This component of the baseline can be carried out either in conjunction with, or separately from the first component of the design.

108

Neither component of the proposal places stringent time restrictions on when it is carried out. However, in view of the technical and logistical complexity of many aspects of the study, it would be wise to allow a year for detailed logistical planning before actual ship operations commence.

109

An Observer, Dr. W. Slaczka, introduced the document IOC/INF-688 which contained the Polish offer, presented during the Thirteenth Session of the IOC Assembly (Paris, February 1985), to use R/V OCEANIA, a new research vessel of the Institute of Oceanography of the Polish Academy of Sciences, in IOC Programmes and, particularly, in the GIPME Open Ocean Baseline Study. He informed the Committee of modifications in the offer. The IOC will be requested to participate in a research exercise and determine the programmes, designate the participants, who, together with Polish scientists (the total number of scientists is ten) will execute the programme. Referring to the ship's equipment, he stressed that the R/V OCEANIA is even now working down to 500 metres and will shortly have the capability of working as far as 2000 metres and, following the installation of an hydraulic winch, even deeper. The ship is to be equipped with most of the equipment identified for execution of the Open Ocean Baseline Study. The ship is also equipped with laboratories of 100 m² space which includes a "clean" laboratory with a laminar hood. The ship could be used starting in 1988 and will be available during the whole year, with the exception of half of June, July and August. He also informed the Committee that should it find the offer acceptable, several experts could be invited to Poland for further discussion and preparation of the cruise programmes. For the organization and execution of such a cruise, IOC is requested to provide financial assistance amounting to US Dollars 1,000 per day, to aid in meeting the total daily ship costs of US\$ 10,000 per day.

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The Delegate of Germany (Federal Republic of) stated that an offer of shiptime might be forthcoming from Germany (Federal Republic of).

The Committee decided that in view of the sampling depth limitations of the R/V OCEANIA, the deep ocean baseline survey segments of the baseline proposal might well be facilitated by conducting the operations on board Germany's (Federal Republic of) vessel, should such an offer be formally forthcoming. The offer of the Government of Poland of the R/V OCEANIA would be best directed to the determination of some Atlantic transects across the continental shelf. In order to facilitate better planning, in the event of an offer from Germany (Federal Republic of), the Committee recommended that the existing ad hoc GEMSI Group on the planning of an open ocean baseline study, comprising a revised membership, proceed with the logistical planning of the open ocean baseline study. The ad hoc Group would undertake detailed logistical planning for the deep ocean baseline, specifically the deep station occupations to enable any offer of shiptime for the years, 1988 or 1989 or both, to be fully utilized.

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The Committee emphasized that this would be the first major global open ocean study to be launched in the framework of the GIPME Programme.

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5.6.2 Caribbean and Adjacent Regions (IOCARIBE)

Dr J. Corredor, the Chairman of the CARIPOL Steering Committee introduced this Agenda Item, referring to documents IOC/INF-633 and IOC/INF-687, the Summary Report of the IOC/UNEP/University of Puerto Rico CARIPOL Symposium - Review of Petroleum Hydrocarbons in the Caribbean. He recalled that the results represented ten years of effort.

113

Plans are being implemented for the second phase of the regional programme, in particular, to establish a network of laboratories using the sentinel organism (e.g. oyster) or musselwatch approach in monitoring. A practical training workshop is being organized for the analysis of petroleum hydrocarbons in biota and sediments (Puerto Morelos, Mexico, 1-16 November 1986) with the support of UNAM (Universidad Autonoma de Mexico), UNEP and IOC, which was gratefully acknowledged. Selected participants from the regional monitoring programme in the South East Pacific would also attend the Puerto Morelos Workshop, a good example of inter-regional co-operation.

114

Dr Corredor further submitted that there was a need to review the progress of the regional programme and define new priorities and plans, as proposed by the Steering Committee for CARIPOL, to be carried out through a regional workshop. The Committee endorsed this proposal.

115

The Chairman expressed his thanks for the presentation and his appreciation, on behalf of the Committee for the considerable progress made in implementing a regional MARPOLMON component in the Caribbean. He noted the need to formally adjust the organizational structure so as to be compatible with the streamlined structure of IOC Subsidiary Bodies, as called for by the Nineteenth Session of the Executive Council, Paris 6-12 March 1986), by establishing a Task Team on Marine Pollution Research and Monitoring for IOCARIBE.

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- 117 The Committee endorsed proposed General Terms of Reference for this Task Team and referred the matter to the IOC Sub-Commission for the Caribbean and Adjacent Regions with the suggestion that it consider the formal establishment of the Task Team as a subsidiary body of the Sub-Commission.
- 118 The Committee took note of the increased interest expressed by the United States to participate in the Regional Programme and the generous offer of Mexico to make a research vessel available for a baseline-type study of contamination, covering the open parts of the Caribbean.
- 119 The Committee noted the implicit recognition of the necessity for such a Study expressed in Document WC/GIPME-VI/8, Annex 2, Section 3.4, and further noted that, whenever national and international regulations permit, such a cruise might serve to aid in the implementation of planned activities regarding monitoring of contamination in marine sediments and oyster tissue.
- 120 The Committee also noted the intention of the Steering Committee to prepare a proposal to be presented to the Sub-Commission for the Caribbean and Adjacent Regions for the establishment of a reference collection of crude oils produced and transported throughout the Region and a library of gas chromatographs and UV fluorescence fingerprints of these substances.
- 121 The Delegate of the US expressed support of the intention of IOCARIBE to develop a "musselwatch" activity throughout the Caribbean region as part of CARIPOL, Phase II. The Delegate stated that the US will take an active role in this activity. As mentioned by the Chairman of CARIPOL, the US will supply a quantity of uncompromised reference materials for use in the IOC, UNAM, UNEP, CPPS training workshop in Mexico (Puerto Morelos 1-16 November 1986). Following discussions with the Chairman of CARIPOL and the observer from Mexico, it was determined that a scientist participating in the US "musselwatch" activity (the US National Status and Trends Programme) should attend the Workshop as Assistant Instructor. This participation in the workshop may lead to continued involvement by the US in development and implementation of the proposed CARIPOL, Phase II "musselwatch" project.

5.6.3 The Western Pacific Region (WESTPAC)

- 122 The Chairman invited Dr J. Brodie, an Observer, to introduce this Item. Dr Brodie began by presenting a report of the First Meeting of the WESTPAC Task Team on Marine Pollution Research and Monitoring, (Townsville, Australia, 17-19 April 1985). The full report can be obtained from the Chairman, Professor C. Burdon-Jones. The progress made on a number of the Task Team's Programme priorities was briefly reviewed (Document IOC/WC-GIPME-VI/6 and Document IOC/WC-GIPME-VI/13).
- 123 The Chairman thanked Dr Brodie for his presentation and emphasised that the WESTPAC Region provided yet another example where IOC and UNEP Regional Programmes are co-operating.

The Committee noted and endorsed the considerable span of activities going on in the WESTPAC Region and that the Task Team was very active and vital. The active support of Australia in this context was also noted. 124

The Delegate of the US reminded the Committee of the offer of the Japan Oceanographic Data Centre to act as a Responsible National Oceanographic Data Centre for MARPOLMON for the WESTPAC Region. This Centre represents an existing regional capability fully committed and available to support the requirements of the WESTPAC Region. 125

The Delegate of China informed the Committee of the willingness of China to host a Workshop on the Use of Marine Sediments in Marine Pollution Monitoring and proposed that it be organized in 1988. The Host Institution would be the Third Institute of Oceanography. The Delegate gave a presentation of the technical facilities which could be offered for 20 scientists, participating in field and laboratory work. The Delegate of China also informed the Committee of on-going relevant work and new developments in the field of marine pollution research and monitoring in China. The Delegate of China emphasized that funds for international travel, as well as for subsistence and accommodation for the participants in the proposed Workshop from outside China must be supplied from international organizations sponsoring the Workshop, as well as funds for such supplementary facilities and equipment which may be required. 126

The Committee expressed its great appreciation to the Delegate of China for the offer, and adopted Recommendation GIPME-VI.2. 127

5.6.4 The Mediterranean Sea

The Technical Secretary introduced this Agenda Item referring to Documents IOC/WC-GIPME-VI/6, paragraphs 69-77, IOC/WC-GIPME-VI/8 paragraphs 71-75 and IOC/WC-GIPME-VI/13. The IOC involvement in the Mediterranean marine pollution research and monitoring activities is considerable, in particular within the framework of the MEDPOL programme component of the Mediterranean Action Plan, but also within the framework of ICSEM. 128

The Committee was informed of considerable activities in the Mediterranean from Delegates, including those from Greece and France. 129

The Delegate from Greece informed the meeting that rapid implementation of existing and new programmes has been made possible. In December 1985, Greece committed a newly built and very well equipped research vessel, 52 metres long. The R/V AEGAIOS has already completed three cruises covering about 150 oceanographic stations and 40 pollution monitoring stations in the Ionian and Aegean seas. He pointed out that this is the most intensive oceanographic and pollution study, which exists, in the region and is conducted in the framework of national programmes and as a contribution to international projects such as POEM (Unesco/IOC) and MEDPOL (UNEP). 130

- 131 The Committee endorsed the involvement and further initiatives of the GIPME Programme in relevant activities in the Mediterranean Sea.

5.6.5 Eastern Central Atlantic

- 132 The Technical Secretary introduced this Item referring to Documents IOC/WC-GIPME-VI/6, paragraphs 78-83, and IOC/WC-GIPME-VI/8, paragraphs 76-79.

- 133 The activities in the field of marine pollution research and monitoring in the Central and Eastern Atlantic (IOCEA) Region have mainly been associated with the Joint FAO-IOC-WHO-IAEA-UNEP Project on Pollution in the Marine Environment (WACAF/2) under the Action Plan for West and Central Africa. Five laboratories in the Region are participating in a network monitoring tar on beaches. Observations of oil slicks and floating tar and of basic oceanographic conditions are being initiated. The First Workshop of Participants in the WACAF/2 Pilot Phase Project was organized by IOC in Dakar, Senegal (28 October - 1 November 1985). Continuation of the project has been assured until the end of 1987.

- 134 During the IOC Symposium on Status and Trends in the development of the GIPME Programme preceding this Session (Document IOC/WC-GIPME-VI/13) it had been suggested that several other priority items should be studied, e.g., problems associated with the release of sewage and solid waste. Litter on beaches was a marked problem in the Region.

- 135 The Technical Secretary informed the Committee that the First Session of the Programme Group for the Central Eastern Atlantic (IOCEA) would be convened in Cape Verde in January 1987. The role of the Programme Group in relation to marine pollution research and monitoring would then be considered in the light of the on-going WACAF/2 project.

- 136 The representative of FAO supplemented the information given on the WACAF 2 Project by pointing out that project activities related to the analysis of metals, organochlorines and petroleum hydrocarbons in biota are the direct responsibility of FAO. IAEA is responsible for organizing, in co-operation with FAO, the intercalibration of analytical techniques; IOC covers the observation of oil slicks and tar on beaches, and WHO is responsible for monitoring the microbiological quality of recreational waters and seafood. By early 1985, a total of 15 research institutes and laboratories from nine countries, some participating in more than one research component, had joined WACAF/2. Major items of equipment were delivered to laboratories, and scientists and technicians were provided with external training to become familiar with the application of AAS and GLC methodologies for the analysis of contaminants in fish.

- 137 The Committee took note of the development and endorsed it as well as the continued efforts to link, as appropriate, IOC activities and WACAF/2 as a regional component of MARPOLMON. The Committee also noted the usefulness of the Symposium preceding this Session in supplying information on new priorities.

5.6.6. South East Pacific

The Technical Secretary introduced this Item referring to Documents IOC/WC-GIPME-VI/6, paragraphs 84-87 and IOC/WC-GIPME-VI/8, paragraphs 80-83. A regional network of laboratories monitoring petroleum hydrocarbons has been built up as part of the UNEP Regional Seas Action Plan for the South East Pacific Region, with IOC as Technical Co-ordinator. 138

A further strengthening of IOC involvement in the Region is expected to be implemented through the IOC Staff Member outposted at the Regional Co-ordinating Unit for the Cartagena Convention in Jamaica. 139

Through this arrangement, a strengthening of the interaction and co-operation between the South East Pacific and Caribbean Regions is envisaged. 140

The Technical Secretary also referred to the Report of the Symposium on Status and Trends in the Development of the GIPME Programme, (Document IOC/WC-GIPME-VI/13), in which some priorities were identified, and an appraisal of the state of overall development had been made. 141

The Committee took note of the information and recommended that continued efforts and support be given from IOC to the implementation of the programme and strengthening of the regional component of MARPOLMON. In particular, the inter-regional co-operation was regarded as important, and again the usefulness of the Symposium preceding this Session in facilitating flow of information and identification of common problems was noted with appreciation. 142

5.6.7. Indian Ocean

The Technical Secretary introduced Items 5.6.7.1 and 5.6.7.2 referring to Documents IOC/WC-GIPME-VI/6, paragraphs 63-68 and IOC/WC-GIPME-VI/8, paragraphs 84-88. 143

5.6.7.1 Central Indian Ocean

The Technical Secretary pointed out that the IOC-Unesco Workshop on Regional Co-operation in the Marine Sciences in the Central Indian Ocean and Adjacent Seas and Gulfs (Colombo, Sri Lanka, 8-13 July 1985, IOC Workshop Report No. 37) had identified marine pollution problems in the Region which are being considered as priorities in attempts to develop regional co-operative marine pollution research and monitoring activities. 144

During the Symposium preceding this Session, examples on local and regional activities in studies related to biological effects of marine pollution were presented (Document IOC/WC-GIPME-VI/13). 145

The Committee took note of the development and recommended that proposals for co-operative marine pollution research and monitoring activities be developed for presentation at the First Session of the Programme Group for the Central Indian Ocean (IOCINDIO), scheduled for the second half of 1987 using the priorities identified in IOC Workshop 146

Report No. 37. Ideas discussed at the Symposium referred to, as well as those discussed by GEEP (Document IOC-(GE)EP-III/3) could be used as an additional basis for the development of such proposals.

5.6.7.2 North and Central Western Indian Ocean

147

The Technical Secretary informed the Scientific Committee that plans are developing to establish regional networks of laboratories for marine pollution monitoring and research within the framework of the project EAF/6: Monitoring and Research Related to the Sources, Levels and Effects of Pollutants in the Eastern African Environment (pilot phase), within the UNEP Regional Seas Programme Action Plan for the Eastern African Region. Contacts had been established with several laboratories in the Region in consultation with the Officers of the Programme Group for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCINCWIO). One priority item is the need for training and assistance, as well as for the availability of several optional levels of sophistication in initiating activities. Proposals along these lines will be presented to the Second Session of IOCINCWIO scheduled for the first half of 1987 in Tanzania.

148

The Committee took note of the information presented and endorsed the established mechanism of consultations, together with the use of experiences from other regions presented at the Symposium preceding this Session and also experiences from training workshops, for the development of proposals and suggestions towards the implementation of a Regional MARPOLMON component to be presented to IOCINCWIO-II.

5.6.8 Other Regions

149

The Chairman briefly introduced this Item referring to Documents IOC/WC-GIPME-VI/6 paragraph 66 and IOC/WC-GIPME-VI/8, paragraphs 89-95. IOC has co-ordinated activities in several other regions related to marine pollution research and monitoring, and attempts are being made to initiate activities in some regions, in particular the South West Atlantic. Experiences from this region had been presented at the Symposium preceding this Session, and those together with other matters brought out at the Symposium would be used in further attempts to build up a regional component of MARPOLMON in the South West Atlantic Region.

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The Committee noted the information and recommended that further efforts be made towards the implementation of regional components of MARPOLMON.

151

The Committee, in discussing the overall regional development, stressed the need to generate a comprehensive overview of regional activities, in view of the considerable actions going on with some common threads, such as sentinel organism monitoring (e.g., musselwatch) advancements in many regions. The Secretary was requested to endeavour to produce such a comprehensive overview, possibly through a refinement of overview tables, and in an appropriate consultation with other Organizations involved.

The Committee considered the tabular overviews produced for the Symposium preceding this Session and agreed that this attempt was useful but needed improvement. The information had been collected from several Regional Bodies, and represented regional states of development. It was also agreed that the data originators should be asked to review the overview table and confirm or adjust their information. 152

The Committee also agreed that the information presented in this way must be used with caution. A false impression may well be conveyed that more activities are going on or have been completed than is the case. Therefore, it is important that active scientists participating in the regional programmes also become involved in evaluating the information. 153

The Committee also agreed to ask GEMSI and GEEP to evaluate the suitability of the topics identified in the tables. The Groups of Experts could possibly modify the headings (topics) in the light of experiences gained over the last decade. 154

It was noted that during the Symposium preceding this Session several priorities had been identified which were common to many regions, e.g., due to sewage disposal, litter and solid waste disposal, mine tailing disposal, changes in production due to increased input of nutrients. Many of these common problems were due to increasing industrialization, and increasing population pressure on the coastal areas. They represented to some extent priorities different from those currently being addressed within the GIPME Programme. 155

The Committee considered that much valuable information had been exchanged and obtained through the Symposium and that the Symposium also helped create a dialogue between regions and between regional bodies and the globally oriented groups GEMSI and GEEP. 156

The Committee accordingly adopted Recommendation SC-GIPME-VI.3. 157

During the discussion following the presentations on progress and activities within regional areas, the Canadian Delegate expressed some concern that the objectives of regional activities were, in many senses, not well expressed or specifically outlined within the strategic plan for the implementation of GIPME (IOC Technical Series No. 25). He further stated that he had gained some impressions of the apparent gulf between global and regional concerns during the symposium which preceded the Session. He proposed that an effort be made to re-evaluate the strategic plan for GIPME in an attempt to more intimately embody the various regional interests and objectives with the dominant global views outlined in IOC Technical Series No. 25. There should also be an attempt to include in the examination of regional programmes, the UNEP Oceans and Coastal Areas Programmes to provide an improved framework for co-sponsored activities such as those in GEMSI. The UNEP Representative supported these proposals. 158

The Committee agreed that, in the light of changing priorities, an increasing involvement of GIPME in the regional seas, the implementation of MARPOLMON at a regional level, as well as the important co-operation with UNEP and regional bodies, a re-examination of certain elements in the Comprehensive Plan for GIPME (IOC Technical Series No. 14) was called for. 159

160 Since UNEP co-sponsors GEMSI, the Representative from UNEP commented, at the invitation of the Chairman, that UNEP would be interested in participating in such a re-examination of certain aspects of the Comprehensive Plan and its strategy. He also stated that UNEP then may be in a position to consider co-sponsorship of the GIPME Programme, provided an appropriate adjustment of the Terms of Reference for the Programme could be found.

161 The Committee recalled Resolution XII-20 of the Twelfth Session of the IOC Assembly, (Paris, 3-29 November 1982) calling for increased co-operation between IOC and UNEP and endorsed the proposal that the GIPME Programme becomes a joint programme between IOC and UNEP, provided appropriate adjustments of the Comprehensive Plan and the Terms of Reference for GIPME are generated.

162 The Committee adopted Recommendation SC-GIPME-VI.4.

6. SCIENTIFIC BASIS FOR POLLUTION ASSESSMENTS

163 The Chairman introduced this Item referring to Documents IOC/WC-GIPME-VI/6, paragraphs 36-39, IOC/WC-GIPME-VI/8, paragraphs 96-122, and to the reports from the Second and Third Sessions of the Group of Experts on Effects of Pollutants (IOC/GGE(EP)-II/3 and IOC/GGE(EP)-III/3, respectively) and to the Preliminary Report on the IOC Workshop on Biological Effects Measurements (Oslo, 11-29 August 1986) (Document IOC/GGE(EP)-III/3 Prov. Extract).

164 The Chairman recalled that this subject addressed the third stage of the Implementation of the Comprehensive Plan for GIPME (IOC Technical Series No. 25, 1986) and is being developed through the activities of GEEP within the GIPME Programme. The Terms of Reference for GEEP had been formulated during the Fifth Session of the Working Committee, Bangkok, 30 July - 3 August 1984.

165 The Committee noted that the Group of Experts on Effects of Pollutants had carried out a very considerable programme in the intersessional period. During the IOC Workshop on Biological Effects Measurements, about 30 participants had applied a suite of different techniques to biota exposed to a pollution gradient and to known degrees of pollution over a period of 4-5 months in three mesocosms with a fourth mesocosm acting as control. The chemical analysis had been largely carried out through the Institute of Marine Research, Bergen, Norway.

166 The Chairman noted the considerable support which had been given to this exercise through national extra-budgetary contributions from the U.S.A. and Norway and expressed the appreciation of the Committee for these contributions. The considerable in-kind contribution from the U.K. through the Institute of Marine Environmental Research, Plymouth was also acknowledged.

167 GEEP is addressing the problem of defining the scientific basis for the identification of vulnerable areas, taking a biological view on this, but realizing that there are also several non-biological factors of considerable importance in this connection, and that a full definition of the total concept requires a multidisciplinary approach (see IOC/GGE(EP)-I/3, p.9).

The Committee endorsed the plans of GEEP to carry out a practical workshop possibly in 1988 studying vulnerability in a tropical ecosystem in association with the Venezuelan Project on the Morrocoy National Park, at the kind invitation of the Venezuelan Government, and the Committee recommended that efforts be made by the Secretary of IOC and Member States to locate funds for such an exercise. This would constitute the initiation of a possible series of pilot projects, carried out in different regions, addressing various aspects of biological effects and vulnerability. Another follow-up exercise was suggested to take place in the WESTPAC Region, possibly in China. 168

GEEP, at its Second Session, had also identified the problem of eutrophication of the marine environment as a very serious one which merits attention from the GIPME Programme. The Committee approved that GEEP give an input to the GESAMP evaluation of consequences of nutrient releases to the marine environment. 169

The Committee took note of the information, and expressed its appreciation for the work done. 170

The US Delegation congratulated GEEP for their efficient actions in organizing and conducting the Biological Effects Measurements Workshop, of which the US was pleased to be a major sponsor. The Delegation expressed the feeling that the future success of the GIPME Programme rests, to a large degree, on the work of GEEP and that the Chairman of GEEP must be involved actively in the deliberations of the Scientific Committee for GIPME. The Delegate of the US therefore expressed his disappointment and regret that the Chairman of GEEP was not present at the Session. Nevertheless, he trusted that it would be possible to maintain effective interaction between GEEP and the US/NOAA in testing and evaluating useful biological effects measurements for use in monitoring and that discussions could soon be held between NOAA and the Chairman, or other representatives of GEEP, regarding the results of the Oslo Workshop and the need for any follow-up workshop, should this prove necessary, to evaluate further those biological effects measurements that may be useful on a regional scale. The Delegate of the USA questioned whether the follow-up workshops would only contain training elements and no further testing of other methods. The Delegate mentioned that the US would be willing to host a workshop which would include testing of new or other methods than those in the Workshop in Oslo. 171

The Technical Secretary explained that new or other methods would be tested in the subsequent workshops, such as certain bioassays in the Venezuelan Workshop, and that GEEP wished to include an element of research and novelty in each workshop (Document IOC/GGE(EP)-III/3). 172

Several Delegations stated that the work of GEEP was very important. Suggestions were made that the establishment of appropriate mechanisms for long-term observations of biological effects was particularly important and that the study of vulnerable areas needed a comprehensive approach. 173

The Delegate of China informed the Committee that China would be willing to consider hosting a Workshop on Biological Effects Measurements after having been informed about the requirements. It was agreed that such information would be provided through the Chairman of GEEP and the Secretariat. 174

- 175 The Observer from the US Marine Mammals Commission proposed that GEEP consider taking up the problem of effects of floating plastics and other entangling matter on the marine mammals population in selected areas, and associated monitoring methodologies.
- 176 The Committee noted that not only biological effects needed to be included when considering the concept of vulnerability, but also other factors influencing the ecosystem were important, including chemical and physical oceanographic factors. The Committee agreed that the work on vulnerable areas within the GIPME Programme should be broadened to cover some such factors, and that chemical speciation could be considered as an important factor to be addressed by GEMSI.
- 177 The Committee took note of the interaction between GEMSI and GEEP which it considered to be very important and the Committee recommended that the Chairmen of the two Groups of Experts should maintain regular contacts, with a view also to consider development of joint projects. In particular the interaction was encouraged in relation to the definition of the scientific basis for identification of vulnerable areas. The Committee endorsed the possibility of generating a series of pilot projects in this context. Reference can here be made to the possibility of using the biosphere reserves identified through the Unesco Programme on Man and the Biosphere.
- 178 The Committee noted that GEEP had expressed interest in interaction with the activities of GESAMP in relation to IGOM and the Review of the State of the Marine Environment and endorsed this interaction.
- 179 The Committee endorsed the report of the Third Session of GEEP and the follow-up proposals, and adopted Recommendation SC-GIPME-VI.5.

7. THE GIPME CONTRIBUTION TO THE EVALUATION OF THE STATE OF THE HEALTH OF THE OCEANS

- 180 The Technical Secretary introduced this Agenda Item, referring to Documents IOC/WC-GIPME-VI/6, paragraphs 128-131 and IOC/WC-GIPME-VI/8, paragraphs 123-125, and its Annex 1.
- 181 The UNEP Technical Secretary for the GESAMP Working Group informed the Scientific Committee that the goal was to obtain a review of contamination levels, using data of assured quality and effects of human influences on the marine environment, so as to supplement and update the first GESAMP Review of the Health of the Oceans. It is expected that the final report will contain a main report summarizing the findings and conclusions, supplemented by more scientific and technical annexes where relevant background information is given. It is also planned to put considerable emphasis on regional reviews following the same outline as the global review.
- 182 The UNEP Technical Secretary of GESAMP informed the Scientific Committee that an agreement had been reached through which FAO and IOC would co-ordinate several regional reviews, in co-operation with relevant regional bodies.

The Chairman of GESAMP reminded the Committee that GESAMP, in its Terms of Reference, was charged with producing regular reviews of the state of health of the marine environment, and suggested that several new concerns for the marine environment had emerged during recent years, as well as more information not available at the time of the first GESAMP review. It would be most welcome and valuable, therefore, if the GIPME Programme, through the Committee and its subsidiary bodies could offer an input to this GESAMP activity.

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The Committee considered the task to be very considerable, requiring critical evaluations of available information. The timetable for the development of the study was noted, with completion expected by 1989, and a review meeting of the state of progress in early 1987.

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The Committee noted that quality assurance of the data used for the preparation of the report would be of great importance, considering that methods had been refined almost continuously and that levels of contamination reported a decade ago had been found to be considerably higher than present methods showed to be the case.

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The Committee agreed that it was appropriate that the relevant GIPME Groups of Experts should endeavour to make an input to the GESAMP study, through appropriate contributions from experts. Such contributions would provide information on state-of-the-art methods, data quality assurances, evaluation of contamination measurements and of biological effects. The Committee confirmed its interest in having the GIPME Programme contribute to the evaluation of the state of the health of the oceans.

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8. MANAGEMENT OF MARPOLMON AND OTHER DATA IN THE FRAMEWORK OF IODE

Speaking on behalf of the Chairman of the Committee for IODE, Mr. Kent Hughes described the capabilities and contributions for handling MARPOLMON data. Included was the mention of the availability of exchange and archival formats, coding schemes for chemical and biological species and quality control routines. It was emphasized that the Committee for IODE is ready to actively assist GIPME in any way possible, and help in the selection of RNODCs-MARPOLMON.

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Mr. Hughes introduced the Report of the Interagency Consultation on International Marine Pollution Data Management, (ICES Headquarters, Copenhagen, 4-6 September 1986) jointly sponsored by IOC, UNEP, ICES and IAEA, (Document IOC/WC-GIPME-VI/8, Annex 3). The following points were emphasized: data management operations should follow thoroughly developed requirement studies; quality indicators should always accompany data elements, as should identification of data originator; data centre staff should become involved with scientific activities; and while regional emphasis presently prevails for marine pollution activities, one should not lose sight of future global requirements. Data centres should not develop in isolation leading to a multiplicity of approaches in data reporting, and hence, duplication of effort. Every attempt should be made to ensure uniformity and use of existing systems. Existing referral systems (e.g., MEDI) should be encouraged to widely publicize availability of data.

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- 189 An ad hoc Sessional Group, composed of representatives from the Helsinki Commission, ICES and the Delegates from Germany (Federal Republic of) and the United States of America, reviewed and accepted with noted corrections the Report of the Interagency Consultation on International Marine Pollution Data Management.
- 190 The ad hoc Group was also requested to provide guidance on concerns expressed that both the Oceans and Coastal Areas Programme of UNEP and the MARPOLMON data gathering activities were now generating data, and that focus should be placed on procedures for data storage and use.
- 191 In the light of the interagency nature of existing and proposed GIPME activities, including MARPOLMON and "Musselwatch" projects, the ad hoc sessional group felt that regular attention must be given to GIPME data management requirements, and in particular that suggestions made in IOC/WC-GIPME-IV/8 Annex III should be followed up as a priority.
- 192 Bearing in mind the Consultation's recommendations for regional relevance to marine pollution management activities, the Committee recommended that an RNODC-MARPOLMON for WESTPAC be established as officially offered by the Japan Oceanographic Data Centre (JODC) and for CARIPOL by the US/NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) and the National Oceanographic Data Center (NODC) after the official offer had been received and studied. The Committee further recommended that the offer by the Odessa Branch of the State Laboratory of the USSR should be modified to specify a region where MARPOLMON support is required. Furthermore, the Committee agreed that the Report of the Interagency Consultation be submitted to the Twelfth Session of IODE in Moscow (December 1986).
- 193 The Committee endorsed the approach of the Interagency Consultation Group on International Marine Pollution Management (Document IOC/WC-GIPME-IV/8, Annex 3), and agreed that the Interagency Consultation Group with suitable additional expertise, e.g., from GEMSI, should continue its work, addressing in particular the suggestions regarding development of guidelines for quality assurance and the adjustment of existing formats for use in marine pollution monitoring data reporting.
- 194 The Committee also agreed that the following tasks need to be addressed:
- (i) assessment of the principles, existing capabilities and requirements for international marine pollution data management;
 - (ii) design of a data management system to meet specific needs, including recommendations for assignments and monitoring of operations (formats, archiving, quality assurance and dissemination);
 - (iii) communication among the generators, managers and users of marine pollution data; and
 - (iv) provision of training, education and mutual assistance as required.

The Committee stressed that existing mechanisms should be used to the greatest extent possible, and advice sought as appropriate through these mechanisms, so that duplication of effort was avoided. Nevertheless, the Interagency Consultation Group should give advice to the Secretary on the possible need for a joint GIPME/IODE Task Team to more efficiently address the matter. 195

9. TRAINING, EDUCATION AND MUTUAL ASSISTANCE (TEMA)

The Chairman introduced the Agenda Item by stating that TEMA objectives within GIPME must be determined by the pragmatic objectives of a well defined programme, with specified goals and objectives. TEMA cannot be an activity under itself. He requested Dr Dawson to briefly summarize the TEMA components of intersessional activities. 196

Dr Dawson pointed out that the GIPME Programme, apart from servicing its Expert Groups (GEMSI and GEEP), in order to provide the best possible advice in implementing a logical strategy for assessing the pollution of the marine environment, by its nature also generates a number of practical and regional activities. These activities almost always fall into a category whereby training, education and mutual assistance is a must for any success. 197

The Committee took note of the TEMA support provided to major recent workshops and intercalibration exercises. 198

In addition to structured training workshops and intercalibrations, a number of scientists had received study grants to attend important scientific symposia and to receive ad hoc training. 199

The Committee agreed that it would be appropriate to solicit and receive offers from Member States indicating training opportunities or assistance they may contribute, and conversely, for Member States to indicate perceived training needs. 200

The Chairman referred to Documents IOC/WC-GIPME-VI/6 and VI/8 and identified two major areas for consideration: 201

- (1) TEMA's role in supporting regional consultations whereby scientists from the regions could be given the opportunity to formulate TEMA needs in the context of on-going or planned exercises of GIPME and MARPOLMON. These consultations may well be considered as adjuncts to the Task Team and other meetings.
- (2) Mechanisms to ensure that important TEMA support is not ad hoc, but based on needs anticipated by the GIPME Programme, its MARPOLMON data gathering activities and specific regional activities. Attention should also be paid to the fact that budgets are prepared both by the Commission and Unesco on a somewhat staggered biennial basis. Any guidance from the Scientific Committee should be both timely and specific.

The Committee noted these points and endorsed the suggestions made with regard to certain use of TEMA funds, the need for identification or priorities and, in particular, the need for evaluation and follow-up. 202

- 203 The Committee endorsed the view that training should be part of a defined project and not an end in itself. The Committee considered that training needs should basically be defined through appropriate Regional Groups of Experts, possibly in consultation with experts from outside the region.
- 204 The Committee considered it important that training be developed at several levels and that ample follow-up be an integral part of it. A first level would be training in the region at home laboratories by experts brought there, either from other laboratories within the region or from outside the region. In this way, the experts from developed laboratories would also receive a clear view of the conditions in other laboratories.
- 205 The regional adjustments in methods and in equipment would facilitate the design of training workshops and training undertaken in the experts' own laboratories.
- 206 The Committee considered it important that regional courses be developed in the region, taking into account the language factor.
- 207 The Committee endorsed the view that trainees should be carefully selected taking into account the capacity of their laboratories and their involvement in the regional programmes. Commitment to a regional monitoring programme would ensure follow-up support through the programme. Visits by experts organizing training courses and workshops to laboratories in the region under consideration in order to help identify conditions, needs and the capability of trainees, were regarded as an essential element.
- 208 The Committee also endorsed the view that it was necessary to develop training at several levels and adjust it to the purposes of the programme which was being carried out. After initial training in the region, it might be appropriate to have trainees spend extended periods at developed laboratories to gradually increase their level of sophistication.
- 209 The Committee agreed that the training philosophy should also be considered in the re-evaluation of the GIPME Comprehensive Plan in order to ensure that specific regional needs, as well as global ones, can be accommodated (Ref. Item 5.6).
- 210 The Committee agreed that in its review of the effectiveness of intercalibrations and workshops (ref. Item 5.3), GEMSI should also take into account the training aspect. If possible, GEMSI might try to generate guidelines, of general applicability for regional activities, covering methods, manuals, equipment, initial requirements for trainees to be able to benefit from certain types of training.

10. CO-OPERATION WITH OTHER ORGANIZATIONS IN THE FIELD OF MARINE
POLLUTION RESEARCH AND MONITORING

The Committee took note of the very considerable co-operation and interaction with other organizations now taking place and being initiated within the GIPME Programme. The Committee endorsed this and encouraged the continuation of the co-operation and the efforts made by the Secretariat to increase it. In particular, the efforts made in joint activities with UNEP, and to obtaining co-sponsorship of GIPME subsidiary groups as well as the possibility of making the programme a joint one with UNEP, were noted and strongly supported.

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10.1 UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP) AND THE
OCEANS AND COASTAL AREAS PROGRAMME ACTIVITY CENTRE (OCA/PAC)

The Representative of UNEP referred to the considerable progress achieved since the Fifth Session of GIPME in strengthening the co-operation with IOC on programmes of mutual interest, such as:

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- effective formal co-sponsorship of GEMSI as a joint IOC/UNEP group, which resulted in the production of several reference methods for marine pollution studies;
- agreement of IOC to support GESAMP working groups on the state of the marine environment (WG.26) and on integrated global ocean monitoring (WG.24);
- agreement to assign to IOC the co-ordination of the technical preparation of six regional reports on the state of the marine environment;
- agreement with IOC to outpost an IOC staff member, funded by UNEP, to the Caribbean Co-ordinating Unit in Jamaica, in order to provide the technical co-ordination for UNEP supported marine pollution research and monitoring activities carried out in the framework of the UNEP sponsored Caribbean and South-East Pacific Action Plans;
- involvement of IOC in a number of projects implemented as part of the Regional Seas Programme in the Mediterranean and the Western and Central African Regions;
- joint sponsorship of several inter-regional workshops relevant to the analysis of marine pollutants;
- joint sponsorship of an interagency consultation on marine pollution data management;
- joint sponsorship of the ad hoc subgroup of GEMSI on reference methods which led to the establishment of the new GIPME group of experts on standards and reference materials; etc.

UNEP would be prepared to further strengthen the co-operation with IOC by:

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- co-sponsoring the GIPME group of experts on standards and reference materials;
- co-sponsoring GEEP, subject to certain non-substantial modifications of its present terms of reference;
- assigning the technical co-ordination to IOC for a number of additional specific marine pollution research and monitoring projects carried out in the framework of the Regional Seas Programme;
- supporting a musselwatch programme as a joint IOC/UNEP activity;
- supporting further interagency consultations on marine pollution data management, including quality control of data.

214 UNEP would also be prepared to consider closer association with GIPME itself, subject to satisfactory arrangements between IOC and UNEP which would fully take into account the interest of UNEP-sponsored global and regional programmes, as well as the legislative framework of these programmes.

215 The Committee took note of this information and positive statement, and noted its relevance in relation to Recommendations SC-GIPME-VI.4 and VI.5. The Committee recalled that co-operation and interaction with UNEP had been referred to under almost all Agenda Items, and strongly endorsed the actions taken and encouraged further efforts to increase co-operation.

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

216 The Representative of the International Council for the Exploration of the Sea (ICES) reported that, during the two years since the last GIPME meeting, a closer co-operation had developed between ICES and IOC, both on the scientific, as well as on the Secretariat levels. In particular, a Memorandum of Understanding has been concluded between IOC and ICES to formalize the co-operation on marine pollution issues that has taken place for well over a decade. This development has resulted in an increase in the types and range of cooperative activities undertaken.

217 The ICES Representative then provided an over-view of activities relevant to GIPME that have been co-ordinated by ICES over the past two years. Among activities mentioned were the conduct of a number of intercalibration exercises, particularly on analyses of trace metals in organisms, sea water and sediments, and the ICES/IOC intercomparison on petroleum hydrocarbons in biota. ICES has also been actively studying the requirements for standards and reference materials and is giving serious consideration to the IOC invitation to co-sponsor the Group of Experts on Standards and Reference Materials.

218 The ICES Representative concluded by stating that co-operation with IOC on issues of mutual interest is not only very valuable, but is also necessary in view of the limited resources available for the study of pollution of the marine environment. ICES looked forward to the continuation of this good co-operation.

The Committee took note of the information presented and the specifics reported in Document IOC/WC-GIPME-VI/6, paragraphs 105-114, and agreed that strengthening of co-operation should continue, in particular within the fields of biological effects studies, and development of standards and reference materials. 219

The Committee also recognized that the experiences gained in ICES in developing evaluations of the state of health of the marine environment in different parts of the ICES area should be utilized by the Committee when re-evaluating its Comprehensive Plan, in the context of regional area programmes. 220

10.3 OTHER UN AND NON-UN ORGANIZATIONS

The Technical Secretary informed the Committee about recent developments in the co-operation with IMO, IAEA and FAO, referring to Document IOC/WC-GIPME-VI/8 paragraphs 148-155. He particularly stressed the importance of the interaction with IMO, through which information of results from the GIPME programme is being transferred to relevant IMO Bodies. 221

The Committee noted the interest expressed by IMO in the work, and the potential contribution to IMO of GEEP, in particular in developing the scientific basis for the definition of vulnerable areas and bioassay techniques for use in the field for monitoring of dumping grounds. 222

The Committee noted that several information papers had been prepared intersessionally and presented to the Scientific Group on Dumping of the London Dumping Convention, and the Marine Environment Protection Committee (of IMO), and that these bodies had expressed considerable appreciation and interest in the information presented. 223

The Committee endorsed and encouraged these interactions with IMO and also noted that the Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP) serves as an advisory group to both IMO and IOC, and that this would ensure co-ordination so that no duplication of efforts would occur. 224

The Committee also expressed positive support to co-operative efforts with IAEA and FAO. 225

The Committee expressed pleasure that several Representatives from other Regional Bodies had participated in the Symposium preceding the Session and in the Session itself, including HELCOM and CPPS. 226

The Representative of the US Marine Mammal Commission raised the subject of persistent plastic debris in the oceans and he noted that developing information has increased the level of concern for this form of pollution among marine scientists and resource managers throughout the world. He noted that lost and discarded fishing nets, net fragments, strapping bands, plastic bags, plastic pellets and other plastic debris pose serious threats for many marine species in many ocean areas; that international efforts to prohibit disposal of plastics from ships is under consideration by the International Maritime Organization through adoption of Optional Annex V of the 1978 Protocol relating to the 227

Convention for the Prevention of Pollution from Ships which is likely to enter into force in the near future; and that papers presented in two special sessions devoted to plastic pollution at the Sixth International Ocean Disposal Symposium (April 1986, Pacific Grove, California) will be included in a special issue of the Marine Pollution Bulletin in early 1987. He also noted that the US National Oceanic and Atmospheric Administration (NOAA) is implementing an intensive programme to better identify and resolve plastic pollution problems and that, among other things, it is currently considering support for a project to develop a manual on methodologies for monitoring plastic debris at sea and on beaches.

228 The Delegate from Greece advised the Committee that an organization of Greek shipowners and seamen (HELMEPA) voluntarily restricts disposal of non-degradable material at sea. The Representative from UNEP noted that existing UNEP Programmes would provide appropriate vehicles for undertaking studies to monitor persistent plastic debris in the ocean.

229 The Committee agreed that the problem of persistent plastic debris represents a potentially serious marine pollution issue, and it noted that, while the matter fell within the purview of the GIPME Programme's responsibilities, this problem had not yet been addressed during the Committee's actions.

230 Therefore, the Committee urged GEEP, in consultation with GEMSI, and in communication with appropriate bodies (e.g., the US Marine Mammal Commission) to consider actions, including development of a methodological manual, as might be appropriate and possible, to facilitate efforts to monitor the effects, as well as the amounts and types, of persistent plastic debris in the ocean. Because the US NOAA has recently undertaken relevant studies, the Committee recommended that GEEP draw upon expertise and information available from the US NOAA and other appropriate organizations during its deliberations on this matter.

11. PLAN OF ACTION FOR THE GIPME PROGRAMME

231 The Technical Secretary introduced this Item, referring to Document IOC/WC-GIPME-VI/8 and its Annex 2, where a draft Action Plan was outlined.

232 The Committee considered it valuable to have available such an Action Plan where objectives, activities and requirements were identified according to the different components of the GIPME Programme and its MARPOLMON. However, the Committee also agreed that the document should be as short as possible and that there should be a section showing the coupling of the various activities listed with the existing Groups and Regional Bodies associated with the work.

233 The Committee also agreed that the listing of the activities and their association to various groups could only be indicative and not obligatory.

The Committee accordingly agreed that this linkage be attempted by an ad hoc sessional group. This subsequently reported, having broken down the grouping as follows: Groups of Experts of the GIPME Programme; IOC Regional Bodies; GESAMP-related activities; activities associated with the IOC-UNEP co-operation and the Regional Seas Programmes; activities associated with co-operation and interaction with other Organizations. 234

The Committee endorsed this breakdown and instructed the Officers of the GIPME Programme to take this breakdown into consideration with regard to the establishment of priorities. The Committee furthermore stated that there was a considerable diversity of activity, and that, in view of the financial and staffing situation of the Secretariat, the setting of priorities was essential. 235

The Committee instructed the Officers of the Programme (GOPPS) to establish priorities, taking into account the elaboration of the present Session. 236

12. IOC PROGRAMME AND BUDGET FOR 1987 AND REQUIREMENT FOR THE FOLLOWING BIENNIUM

The Technical Secretary introduced the Item referring to Document IOC/WC-GIPME-VI/8, paragraphs 159-178, and to Documents IOC/EC-XIX/7 and Extracts from the Unesco Approved Programme and Budget for 1986-1987 (23C/5 Approved). 237

The Committee noted that the setting of priorities would be developed by GOPPS and taken into account, as far as possible, in the formulation of the budgetary requirements for the biennium. 238

The Committee recalled the identification of needs in relation to specific regional activities, and its discussions under Agenda Item 9, that the GIPME Programme has increasing budgetary demands in relation to TEMA activities associated with the implementation of the Programme at a regional level and urged that this be appropriately taken into account in the planning of the requirements and budget for TEMA activities in the biennium 1988-1989. 239

The Committee also recalled the developing activities with regard to management of marine pollution monitoring data and urged that this be given appropriate attention within the planning of the budget for the IODE Programme for the biennium 1988-1989. 240

The Committee furthermore recognized that new developments are occurring, as exemplified during the Symposium preceding this Session and in several Agenda Items, and the desirability that the GIPME Programme incorporate new techniques and methods and include new areas of concern. 241

The Committee recommended that appropriate attention also be given to these developments in the budgetary allocations for the biennium 1988-1989. 242

The Committee, considering the GIPME Programme as one major and most mature IOC Programme, expressed grave concern on several occasions during the Session, about the staffing situation for the GIPME Programme in the Secretariat. 243

244 The Committee urged Member States to take this into account at the forthcoming Assembly when considering proposals to be submitted to Unesco for the 1988-1989 Biennium, so as to prevent a stagnation of the GIPME Programme.

13. ELECTION OF OFFICERS

245 Pursuant to the IOC Guidelines for the Structure and Responsibilities of IOC Subsidiary Bodies (IOC Manual, Part I, Section 5.2.3), the Committee was requested to elect a Vice-Chairman, the Chairman serving only his first session. The Chairman accordingly invited nominations for Vice-Chairman.

246 The Delegate of Thailand nominated the outgoing Vice-Chairman for re-election to one additional term of office. This proposal was seconded by the Delegate of Germany (Federal Republic of) and by the Delegate of China. The Committee unanimously elected the Vice-Chairman, Dr R. Chesselet.

14. DATE AND PLACE OF NEXT SESSION

247 The Chairman invited suggestions for a venue for the next Session.

248 The Delegate of the US suggested that the Secretary explore the possibility of convening the next Session at a suitable regional facility, in order to stimulate interaction within regional activities and to ensure an appropriate representation.

249 The Delegate from Canada supported this proposal and the Committee endorsed it. The Committee agreed that Paris would be the first alternative.

250 The timing of the next Session would be in 1988 or 1989, the precise period to be determined.

15. ADOPTION OF THE SUMMARY REPORT

251 The Committee adopted the Draft Summary Report of the Session, including its Annexes, during the Session.

252 The Committee agreed that the Secretary of IOC should retain the usual editorial freedom to prepare the final version.

16 CLOSURE

253 The Chairman closed the Session at 12.30 hours, on Wednesday 1 October 1986.

ANNEX I

AGENDA

1. OPENING
2. ADMINISTRATIVE ARRANGEMENTS
 - 2.1 ADOPTION OF THE AGENDA
 - 2.2 DESIGNATION OF RAPORTEURS
 - 2.3 CONDUCT OF SESSIONS, TIMETABLE AND DOCUMENTATION
3. INTERSESSIONAL ACTIVITIES
4. THE ROLE OF GIPME IN GLOBAL STUDIES
5. THE GLOBAL MARINE POLLUTION MONITORING SYSTEM
 - 5.1 METHODOLOGICAL DEVELOPMENTS
 - 5.2 REFERENCE MATERIALS FOR USE IN MARINE CHEMISTRY
 - 5.3 INTERCALIBRATION AND INTER-COMPARISON ACTIVITIES
 - 5.4 WORKSHOPS AND SYMPOSIA
 - 5.5 INTEGRATED GLOBAL OCEAN MONITORING
 - 5.6 REGIONAL ACTIVITIES
 - 5.6.1 Open ocean baseline studies
 - 5.6.2 IOCARIBE
 - 5.6.3 WESTPAC
 - 5.6.4 Mediterranean Sea
 - 5.6.5 Eastern Central Atlantic
 - 5.6.6 South East Pacific
 - 5.6.7 Indian Ocean
 - 5.6.8 Other Regions
6. SCIENTIFIC BASIS FOR POLLUTION ASSESSMENTS
7. THE GIPME CONTRIBUTION TO THE EVALUATION OF THE STATE OF THE HEALTH OF THE OCEANS
8. MANAGEMENT OF MARPOLMON AND OTHER DATA IN THE FRAMEWORK OF IODE
9. TRAINING, EDUCATION AND MUTUAL ASSISTANCE (TEMA) IN SUPPORT OF GIPME AND MARPOLMON

10. COOPERATION WITH OTHER ORGANIZATIONS IN THE FIELD OF MARINE POLLUTION
RESEARCH AND MONITORING
 - 10.1 UNITED NATIONS ENVIRONMENT PROGRAMME AND ITS REGIONAL SEAS
PROGRAMME
 - 10.2 INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA
 - 10.3 OTHER UN AND NON-UN ORGANIZATIONS
11. PLAN OF ACTION FOR THE GIPME PROGRAMME
12. IOC PROGRAMME AND BUDGET FOR 1987 AND REQUIREMENT FOR THE FOLLOWING
BIENNIUM
13. ELECTION OF OFFICERS
14. DATE AND PLACE OF NEXT SESSION
15. ADOPTION OF SUMMARY REPORT
16. CLOSURE

ANNEX II

RECOMMENDATIONS

<u>Recommendation number</u>	<u>Title</u>
SC-GIPME-VI.1	International Musselwatch
SC-GIPME-VI.2	Workshop on the use of marine sediments in marine pollution monitoring
SC-GIPME-VI.3	Scientific Seminars
SC-GIPME-VI.4	Closer co-operation between the IOC Programme on Global Investigation of Pollution in the Marine Environment and the United Nations Environment Programme
SC-GIPME-VI.5	Co-sponsorship of the Group of Experts on Effects of Pollutants (GEEP)

Recommendation SC-GIPME-VI.1

INTERNATIONAL MUSSELWATCH

The Committee for the Global Investigation of Pollution in the Marine Environment,

Noting the increasing interest and need for an evaluation of the contamination by selected synthetical organics in tropical and southern hemispherical regions of the world oceans,

Recommends that (i) an International Musselwatch for selected organochlorine pesticides be organized, whose goal would be to compare the distribution of these pesticides in the northern and southern hemispheres and in the tropics; (ii) the pesticides chosen should be those for which acceptable standards and methods exist; (iii) the monitored sentinel species should include bivalves appropriate to each region; (iv) the preserved samples should be archived to serve as a resource for future environmental baselines after agreement of contributing scientists on any subsequent use; (v) a limited number of analytical centres in both the northern and southern hemispheres should be engaged in the chemical analysis and in the analysis and treatment of data. These centres should undertake a rigorous quality assurance programme.

Further recommends that this programme be given priority support by IOC through GIPME.

Instructs the Secretary of IOC to investigate mechanisms by which resources could be mobilized for this activity from participating Member States and from co-operation with other appropriate agencies, in particular, UNEP, FAO and IAEA.

Recommendation SC-GIPME-VI.2

WORKSHOP ON THE USE OF MARINE SEDIMENTS IN
MARINE POLLUTION MONITORING

The Committee for the Global Investigation of Pollution in the Marine Environment,

Noting the considerable interest and work which has been devoted to the development of guidelines for the use of sediments in marine pollution monitoring within GEMSI,

Being informed of the generous offer of China to host a workshop on the use of marine sediments in marine pollution monitoring,

Recommends that GEMSI, in co-operation with the WESTPAC Task Team on Marine Pollution Research and Monitoring, define the objectives and approach for such a workshop, taking into account the GIPME priorities as determined by the Officers of the Programme, and subject to the availability of funds.

Instructs the Secretary IOC to identify funds for such a Workshop.

Recommendation SC-GIPME-VI.3

SCIENTIFIC SEMINARS

The Committee for the Global Investigation of Pollution in the Marine Environment,

Noting the success of the IOC Symposium on Status and Trends in the Development of the GIPME Programme, 22-24 September 1986,

Realizing the importance of establishing a mechanism for a dialogue between participants in the different components of the GIPME Programme, and the participants in regional marine pollution research and monitoring programmes from different regions,

Considering that such a mechanism can serve as a means of evaluating programme activities and a forum for the resolution of outstanding scientific issues on GIPME,

Recommends that, discretion be given to the Officers of the Programme in consultation with the Secretary, to convene similar seminars prior to future meetings of the Committee, in cases where the nature and complexity of scientific issues warrants it.

Recommendation SC-GIPME-VI.4

CLOSER CO-OPERATION BETWEEN IOC/GLOBAL INVESTIGATION OF
POLLUTION IN THE MARINE ENVIRONMENT (GIPME) AND THE
UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

The Committee for the Global Investigation of Pollution in the Marine Environment,

Recognizing the need for, and benefits from closer co-operation between GIPME and UNEP's ocean related Programme

Recommends that a proposal for such co-operation be formulated in co-operation with UNEP on the basis of a comprehensive analysis of the content, results and strategies of marine pollution related programmes of IOC and UNEP, on both regional and global perspectives, and be submitted for consideration of the respective policy-making bodies of IOC and UNEP.

Recommends further that the proposal be prepared in a time frame allowing it to be presented to the Fourteenth Assembly of IOC, Paris, 17 March - 1 April 1987.

Recommendation SC-GIPME-VI.5

CO-SPONSORSHIP OF THE GROUP OF
EXPERTS ON EFFECTS OF POLLUTANTS

The Committee for the Global Investigation of Pollution in the Marine Environment,

Noting the recent significant development in the activities of GEEP,

Being aware of the need to further develop and maintain a strong capability in the field of biological effects studies, and to cover the needs of the different ocean regions and regional seas in this respect

Recommends that UNEP be invited to co-sponsor GEEP.

ANNEX III

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ANNEX IV

MANUALS AND GUIDES

Following the submission of a paper by Drs. Uthe, Museal and Misra on experiences gained during the Workshop on Organochlorine Measurements in Biota convened in June/July 1986 in Papua New Guinea, the Committee considered the needs and procedures for the improvement of manuals and guides describing analytical and other methods for the measurement of contaminants in the marine environment.

During the Symposium on Status and Trends in the Development of the GIPME Programme convened prior to the present Session, it became clear that there existed some outstanding problems in the description of techniques, and some confusion concerning the intended application of such techniques. The Committee therefore undertook, through the activities of a sessional ad hoc group to develop a rationale philosophy for the preparation of manuals and guides describing methods at various levels of sophistication and for different applications.

It appears that there is a range of applications and objectives for which specific methods are required. At one end of the spectrum, straightforward and unsophisticated methods are required for the determination of the general incidence and distribution of contaminants in developing regions. Given objectives of the kind that require a relatively simple measurement of the presence of contaminants in coastal areas, methods can be developed and described for routine application for these purposes. In many cases, such simple techniques can provide not only an indication of the presence of groups of contaminants, but can also provide some information on spatial and temporal trends.

Methods described for these kinds of application should, whenever possible, be based upon the use of commonly available instruments, apparatus and chemicals. Furthermore, the description of such techniques should always be as comprehensive as possible, including not only the practical description of the techniques, but also a thorough explanation of the scientific basis of the techniques annexing the full texts of supporting papers. This will enable the potential users to gain an appreciation of the basis and suitable applications of the methods, and to use the manual without the need for the requisition of additional literature.

Furthermore, because the analyses of interest in specific coastal areas may well differ among countries and differ from those of primary concern in a global context, there is a need to consider the production of manuals and guides for a range of analytes besides those of most common global and regional interest. The mechanisms of regional interaction, both within GIPME and UNEP OCA/PAC should be used to permit individual countries and their scientists to specify their needs in this respect. Once specific analytes have been identified in this way, plans can be made for the preparation of manuals.

At the other end of the spectrum, analytes are chosen from a global perspective and there exists a desire to acquire data for regional or global mass-balance applications. In many cases, the analyte required to be measured is a specific component of a class of contaminant, rather than some general group of compounds. In such cases, the manual should be prepared on the basis of an evaluation of the likely users. If the users are likely to be predominantly scientists in developed countries, the manual can be written in the form of a guide to the procedure, rather than an exhaustive description of the scientific basis of the technique appending all relevant literature. However, should there exist a likelihood that scientists in developing countries would be interested in applying the technique within a period of 2-3 years, the manual should adopt the more comprehensive approach described earlier. It would be axiomatic that these latter, generally more specific, techniques would not be subjected to the constraints in respect of apparatus and chemicals that were expressed for techniques intended for application predominantly in developing countries. The techniques likely to be applied in developed countries having a high degree of sophistication will necessarily require the use of specific apparatus, instruments and chemicals to achieve their objective.

ANNEX V

GROUP OF EXPERTS ON STANDARDS AND REFERENCE MATERIALS

Terms of Reference

The Group of Experts on Standards and Reference Materials provides a means whereby its sponsoring bodies IOC, IAEA and UNEP (as well as other potential sponsoring bodies, i.e. ICES), obtain advice on matters relating to the provision of standards and reference materials for marine pollution and marine chemistry activities. Specifically the Group of Experts on Standards and Reference Materials:

- (i) Provides advice on the availability of standards and reference materials;
- (ii) Provides advice on the co-ordination of efforts to develop and distribute standards and reference materials;
- (iii) Co-ordinates activities on the resolution of analytical problems relating to the preparation of such materials;
- (iv) Plans the long-term development of marine analytical chemistry reference materials, recommends priorities and estimates resources needed in response to requirements from the sponsoring organizations.
- (v) Promotes communication between marine and analytical chemistry groups, in the use of reference materials.

The Group of Experts on Standards and Reference Materials, in pursuing the above objectives, consults and interacts with related international groups including GEMSI and GEEP. It reports regularly to its parent and sponsoring bodies IOC, IAEA and UNEP (as well as ICES, should this Organization agree to co-sponsor the Group of Experts).

ANNEX VI

CONSIDERATIONS OF INITIATIVES FOR
GLOBAL INTERNATIONAL MUSSELWATCH

The outcome of a recent discussion on the feasibility of initiating a global contaminant monitoring programme was presented to the Committee for its consideration. An international Musselwatch has been proposed, whose goal is to ascertain whether or not the present levels of organochlorine pesticides in the environment, particularly in the southern hemisphere and the tropics, are a continuing threat to marine ecosystems. The results will be compared with the levels in the northern hemisphere that led to an adverse impact on non-target organisms in the 1960s and 1970s.

It was proposed that approximately 500- 1000 stations in as many as 100 countries be sampled in both the northern and southern hemispheres. That samples be analysed by a limited number - approximately five - of regional centres in order to improve the intercomparability of data. That centres perform stringent inter- and intralaboratory quality assurance programmes.

It was pointed out in this respect, that the IAEA/ILMR laboratory in Monaco may play a role as a regional analytical centre having co-operative programmes with scientists involved in a number of UNEP Regional Seas Action Plans.

Similarly, the South Pacific Regional Environment Programme and its consortium of laboratories, may engage the facilities of the University of the South Pacific in Fiji as such a regional centre.

Participating scientists would be encouraged to analyze the same contaminants in subsamples in their own facilities. Where possible, participating countries may wish to send scientists to regional centres to participate in the analyses and interpretation of data.

Such a programme will provide a pattern for further global monitoring exercises and a springboard to study other pollutants.

The restriction of the International Musselwatch to a study of organochlorine pesticides is considered important for the following reasons:

(i) the contaminants have been directly linked to deleterious effects to all stages in aquatic food chains, but primarily at the upper levels where fish, mammals and birds have suffered morbidities and mortalities.

(ii) limiting the suite of candidate components will facilitate, to some extent, the gas chromatography and mass spectrometry methodologies.

The choice of compounds, in part based upon use and production data provided by participating countries and by the FAO Statistical Index, will also be made with an awareness of the certified reference materials currently available (see Agenda Item 5.2).

Where possible, data on pesticide production and use may be gathered or obtained from appropriate national or international organizations. This will assist both in the design of the analytical procedures for pesticide identification and the interpretation of contaminant distribution.

In restricting the first International Musselwatch to the study of organochlorine pesticides, it is recognized that the material, if properly collected, preserved and archived, may serve for future studies of other contaminant classes. Any future study will be subject to re-negotiation with the scientists of the regions and a separate strategy should be worked out for any subsequent use of the archived material.

Such samples will provide the possibility of establishing a time series for contaminant concentrations and of analyzing substances identified in the future, as jeopardizing environmental resources.

Biologists familiar with local biota should play an integral part in recommending sentinel species and collection sites. It was recognized that a limited number of collection sites could also serve as research sites, for detailed studies of biogeochemical cycles and effects of contaminants on a longer time basis.

Although the term Musselwatch has gained popular acceptance in its context and indeed has been a term that the public can identify with, the incorporation of the word "Mussel" into the title of the activity has caused some confusion that this is limited to the species *Mytilis* and variants. A more accurate description of the programme activities would embody the term Bivalve Sentinel Organisms.

Nearly all national and regional contaminant monitoring activities, including those of the action Plans of many of the UNEP Regional Seas areas, and those of FAO programmes for the monitoring of edible and commercial species, took note of, or recommended monitoring strategies based, in part, on the use of sentinel bivalves.

A discussion arose over the use of artificial substrates, in an attempt to exclude variabilities introduced by biological factors, e.g., spawning, season, etc, and to overcome problems associated with sample preservation storage and distribution. It was concluded that considerably more research was required to bring technology to the point of applicability to the needs addressed by the proposal.

In addition, concerns were raised by the Chairman of GEEP that excluding biological sentinel organisms would detract the focus of the exercise from concerns about biological effects, environmental concerns or even human health considerations.

It was agreed that this programme would provide a current assessment of the state of contamination by organochlorine pesticides of coastal areas of the tropics and southern hemisphere, in comparison with

those in the northern hemisphere for which previous data exists for a number of countries. Data for the southern hemisphere and tropics are less extensive although some Member States have undertaken such programmes. This assessment may then serve as a baseline or reference for future programmes mounted on national or international scales, and this assessment will provide valuable input to the GIPME Comprehensive Plan and its MARPOLMON data base.

It was generally agreed that such a programme could be undertaken and completed within a three-year period. A year of planning, a year of collecting and analysis and a year to complete analyses and data interpretation. This significant effort, if conducted properly, will involve a financial commitment of 1.2 million US Dollars. This does not include data contributions from on-going activities of Member States or of regional groups. They are further encouraged to continue their national programmes as part of this effort.

This activity requires co-operation among international organizations and their regional bodies. It is anticipated that this activity will be a model providing a framework and foundation for longer term contaminant monitoring activities in the world's coastal areas in accord with longer term objectives of the Global Environment Monitoring System.

ANNEX VII

LIST OF ACRONYMS

CARIPOL	Caribbean Pollution Programme
CCCCO	Climatic Changes and Conditions in the Ocean
CPPS	Comision Permanente del Pacifico Sur
FAO	Food and Agriculture Organization of the United Nations
GEEP (IOC)	GIPME Group of Experts on Effects of Pollutants
GEMSI (IOC)	GIPME Group of Experts on Methods, Standards and Intercalibration
GEMS (UNEP)	Global Environment Monitoring System
GESAMP (IMCO-FAO Unesco-WMO-WHO IAEA-UN-UNEP)	Joint Group of Experts on the Scientific Aspects of Marine Pollution
GIPME (IOC)	Global Investigation of Pollution in the Marine Environment; Scientific Committee for GIPME
GLOSS	Global Ocean Sea Surface Study
GOFs	Global Ocean Flux Study
GOPPS	GIPME Officers Planning and Priorities
GRID	Global Resources Inventory Database
IAEA	International Atomic Energy Agency
ICES	International Council for the Exploration of the Sea
ICSPRO (UN-FAO- Uneso-WMO-IMO)	Intersecretariat Committee on Scientific Programmes Relating to Oceanography
ICSU	International Council of Scientific Unions
IGBP	International Geosphere-Biosphere Project
IGOM	Integrated Global Ocean Monitoring
IGOSS (IOC-WMO)	Integrated Global Ocean Services
IMO	International Maritime Organization
IOCARIBE (IOC)	Sub-Commission for the Caribbean and Adjacent Regions

MARPOLMON (IOC)	Marine Pollution Monitoring Programme
NOAA (USA)	National Oceanic and Atmospheric Administration
OCA/PAC (UNEP)	Oceans and Coastal Areas Programme Activities Centre
OSLR (IOC-FAO)	Ocean Science in Relation to Living Resources
OSNLR	Ocean Science in Relation to Non-Living Resources
REMCO-ISO	Reference Materials Committee of the International Standards Organization
RNODC	Responsible National Oceanographic Data Centre
SCOR(ICSU)	Scientific Committee on Oceanic Research
TEMA (IOC)	Training, Education and Mutual Assistance
UNEP	United Nations Environment Programme
WESTPAC (IOC)	IOC Programme Group for the Western Pacific
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment