Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area

Geneva, 17-18 June 1992

UNESCO

In this Series, entitled

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued.

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
3. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' *(Also printed in Spanish)*
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
11. First Session of the IOC Consultative Group on Ocean Mapping *(Also printed in French and Spanish)*
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13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
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15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
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55. Fifth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
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1. OPENING OF THE MEETING

1 The meeting was opened by the Executive Secretary of the Regional Organisation for the Protection of the Marine Environment (ROPME), His Excellency, Dr. Abdul Rahman Al-Awadi and the Secretary IOC, Dr. Gunnar Kullenberg, by 10 a.m. on Wednesday 17 June 1992.

2 A meeting of the *Ad hoc* Scientific Sub-Committee had been convened the previous day at the same venue to discuss the scientific items on the Agenda and prepare recommendations as appropriate for possible adoption by this meeting. The report of the meeting of the Sub-Committee is attached as Annex I.

3 Dr. Al-Awadi welcomed the participants and pointed out that this meeting was timed so soon after the MOUNT MITCHELL CRUISE in order to maintain the momentum generated by that cruise. He thanked the National Oceanic and Atmospheric Administration (NOAA) for the generous offer, through the Intergovernmental Oceanographic Commission (IOC), of the MOUNT MITCHELL that made the cruise possible and thanked the IOC for working closely with ROPME to make the cruise successful. He welcomed the Representative of UNEP and noted UNEP's role in co-ordinating the U.N. Interagency Plan of Action within which framework most of activities to study and combat war-related pollution in the ROPME Sea Area were initiated and hoped UNEP would continue this leadership role in the implementation of the Consolidated Rehabilisation Programme.

4 On his part, Dr. Kullenberg congratulated ROPME for providing the focus around which the Integrated Project Plan (IPP) was formulated and the cruise carried out. He stressed that it was both important and urgent to take another look at the Plan in the light of the experiences gained from the MOUNT MITCHELL Cruise and to re-define its objectives and targets if need be. He expressed gratitude to the US Under Secretary for Commerce, Dr. John Knauss, for making the ship available through the IOC. He pointed out the need to streamline future IPP activities in the ROPME Sea Area, noting the necessity to keep them co-ordinated with UNEP's efforts to bring to fruition the wider objectives of the Consolidated Rehabilitation Programme of which the Integrated Project Plan constitutes the marine component.

5 The UNEP Representative, Dr. Makram Gerges, expressed appreciation to the Executive Secretary of ROPME and the Secretary IOC for welcoming UNEP to this meeting and for recognising UNEP's role in leading the UN Interagency Plan of Action. He further confirmed UNEP's commitment towards the follow-up of the Interagency Plan of Action, including the development and implementation of the Consolidated Rehabilitation Programme (CRP) which has the Integrated Project Plan (IPP) as its marine component. To this effect, UNEP stands ready to co-operate with ROPME and IOC in order to ensure the effective implementation of the IPP.

6 20 participants drawn from the ROPME Region, the United Nations Agencies and International/National Organizations attended the meeting (Annex II).

2. ORGANISATION OF WORK

2.1 ADOPTION OF THE AGENDA

7 The Provisional Agenda circulated by the Joint Secretariat was adopted as the Agenda for the meeting.

2.2 DESIGNATION OF CHAIRMAN AND RAPPORTEUR

8 In accordance with the procedures agreed upon during the first meeting of the Steering Committee in Kuwait, 24 - 27 September 1991, Dr. Nizar Tawfiq and Dr. Faiza Al-Yamani were designated Chairman and Rapporteur respectively.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

9 The IOC Technical Secretary explained that the meeting would work in plenary but that *Ad hoc* Drafting Groups would be formed if necessary.

10 He introduced the documentation (ROPME-IOC/STEER-II/4 prov.) and informed participants of the timetable and other administrative arrangements for the meeting.

3. REVIEW OF MOUNT MITCHELL CRUISE, THE INTEGRATED PROJECT PLAN, ETC.

3.1 ROPME-NOAA-IOC OCEANOGRAPHIC CRUISE REPORT

11 Dr. John Robinson gave a synopsis of the objectives and targets of the 100 day-cruise carried out on board NOAA's MOUNT MITCHELL. He said that 129 scientists from 15 countries in and outside the ROPME Region participated and that it had been a phenomenal success. He called upon the leaders/co-leaders to represent highlights of the undertakings and achievements in each Leg. A summary of their reports is attached as Appendix 2 of Annex I.

12 Dr. John Knauss, Administrator of NOAA, said that the cruise was an important scientific achievement but that even more striking was the spirit of regional and international co-operation which it had engendered. To have so many scientists from so many countries involved in such a co-operative effort was for him one of the highlights of the results of the cruise.

13 In reply to questions on future work in the region in the light of the results of the MOUNT MITCHELL Cruise, the IOC Technical Secretary informed the Committee that these had been identified by the *Ad hoc* scientific sub-committee that met on 16 June 1992 and is reflected in the report of that meeting (see Annex I).

3.2 PROGRESS IN THE NATIONAL (COASTAL) COMPONENT OF THE INTEGRATED PROJECT PLAN

14 Dr. Faiza Al-Yamani informed the meeting of the lack of substantial progress in this component and said that lack of adequate manpower and/or equipment had been the major hinderance. She informed the Committee that the *Ad hoc* Scientific Sub-Committee set up a small sub-group to prioritise the areas of future work as identified on the basis of the MOUNT MITCHELL Cruise expertise.

15 Mr. Borhan presented the outcome of the deliberations of this group. His report is attached as Annex III.

3.3 FUTURE OCEANOGRAPHIC CRUISES

16 As a result of discussions held on 16 June in the meeting of the *Ad hoc* Scientific Sub-Committee it was agreed that future cruises should focus on the themes identified as constituting outstanding work.

17 Dr. Mohammed Hassan, Task Force Leader for the Muktabar Albihar Summer Cruise, gave the main elements of this planned cruise while the IOC Technical Secretary informed the Committee of the objectives and expected outputs of the Japanese Cruise. The major elements of their presentations are contained in the report of the *Ad hoc* Scientific Sub-Committee (Annex I).

18 Professor Izdar confirmed the offer of a platform for a cruise in the summer of 1993 from the Oceanographic Network for Islamic countries as presented the previous day by Dr. Ergun (see Annex I).

19 The possibility of a cruise on board an Indian vessel in late 1993 was mentioned as well as another cruise in late 1995 related to the Joint Global Ocean Flux Studies.

20 Both the Executive Secretary of ROPME and the Steering Committee Chairman, Dr. Nizar Tawfiq, stressed the need to tailor investigations in future cruises to the major concerns of the region as was the case of the implemented MOUNT MITCHELL Cruise. It was suggested that IOC should convey to the Japanese the usefulness of focussing on fisheries studies and of including the northern reaches of the ROPME Sea Area in their area of coverage so as to gain knowledge on fisheries in areas most impacted by the oil spill.

21 A Task Force for the Japanese Cruise was set up as follows:

- Assad Al-Thukair, Saudi Arabia
- Faiza Al-Yamani, ROPME
- Mohammed Borhan, ROPME
- Othman A.H. Omar, Saudi Arabia
- Solaiman Al-Mattar, Kuwait
- Chidi Ibe, IOC

22 Professor Izdar and Dr. Ergun said that advanced planning is vital to the success of the two-month-cruise planned under the auspices of INOC and that he was ready even now to initiate discussions with appointed scientists on the broad scientific programmes of the cruise.

3.4 ESTABLISHMENT OF INTERNATIONAL SCIENTIFIC CRUISE COMMITTEE

23 The meeting accepted the recommendation of the *Ad hoc* Scientific Sub-Committee that the Steering Committee should continue to serve the role of co-ordinating all future cruises in the region and that Task Forces should be set up as and when due to plan and implement specific cruises.

3.5 ORGANISATION OF A ROPME-IOC-UNEP WORKSHOP IN THE REGION IN JANUARY 1993

24 Both the Executive Secretary of ROPME and the Secretary IOC emphasized that this event is a scientific meeting organised under the aegis of the Steering Committee in the form of an expanded Steering Committee Meeting to consider a preliminary analysis of the results from the MOUNT MITCHELL Cruise. They said this was to be seen as one step in the organization of the Intergovernmental Conference planned for Tehran in the last quarter of 1993 to review the entire Integrated Project Plan for the Coastal and Marine Environment of the ROPME Region. The results of the scientific meeting will feed into the Intergovernmental Conference in Tehran.

25 UNEP was invited by the IOC Secretary and the Executive Secretary of ROPME to co-sponsor the scientific meeting in January 1993. This was readily accepted by the Representative of UNEP.

26 The Committee accepted the scientific programmes and the allocated responsibilities as worked out by the *Ad hoc* Scientific Sub-committee (see Annex I).

27 It was agreed that some officers of GIPME and its Groups of Experts would be invited to chair or co-chair some of the sessions.

28 With respect to local organization, the IOC Technical Secretary reported on the outcome of his trip to the United Arab Emirates. He said that the ROPME Focal Point in the United Arab Emirates, Dr. Muhaideb, had assured him during their discussions that they would willingly undertake all aspects of local organisation except the provision of secretarial services. THe IOC Technical Secretary had promised Dr. Muhaideb that ROPME would send to him a list of requirements for hosting the meeting.

29 The possibility of organizing the meeting in Qatar was raised in the light of a plan by the University of Qatar to host an international conference on the environment in the ROPME Region next year.

30 Dr. Abdul Rahman Al-Awadi promised to explore both possibilities and to convey his decision on a location to the Organising Committee within one week.

31 The sub-group charged with drafting the announcement for the meeting presented its work which was accepted with some amendments (Annex IV).

32 The issue of the multiplicity of international conferences on the environmental pollution in the ROPME Sea Area being planned by different countries in the region was raised. The general feeling was that this is not necessarily bad; if anything it was a positive development in terms of generating public awareness but it was stressed that such meetings need to be streamlined and co-ordinated by ROPME.

33 The Steering Committee recommended that ROPME should aim at organizing a regional scientific meeting either annually or biennially to sustain the momentum and present regional scientists with an opportunity to periodically present the results of their research and monitoring endeavours as well as to interact at the personal level. Such meetings should be rotated between the countries in the region.

3.6 THE INTEGRATED PROJECT PLAN WITH EMPHASIS ON OUTSTANDING WORK INCLUDING REGIONAL CAPACITY BUILDING

34 The IOC Technical Secretary informed the Committee that the *Ad hoc* Scientific Sub-Committee had reviewed the Integrated Project Plan in the light of the MOUNT MITCHELL Cruise as well as the scientific investigations for a comprehensive assessment of the impact of the 1991 oil spill. The urgency of implementing the national (coastal) components was again highlighted and ROPME was urged to ensure this through the mechanism of ROPME focal points in member states.

35 The IOC Technical Secretary informed the meeting that arrangements had been concluded on a joint ROPME-IOC training course on marine data and information management to be held in Kuwait in October 1992. ROPME was in the process of assessing the feasibility (in terms of obtaining adequate participation from the region) of another course on remote sensing which had been proposed to it by IOC and which would be organised in Saudi Arabia. This course is now more likely to be held in 1993.

36 On regional capacity building, a suggestion was made to establish a regional training center within the region. Manpower development should be both at the formal level (eg. University Training) and through hands on experience.

Dr. Amin Meshal informed the Committee that the UNESCO Regional Office for Science and Technology for the Arab States had concluded an arrangement with the University of Qatar for the organisation, later this year, of a training workshop on current meter mooring and retrieval and processing of current meter data.

37 Dr. Makram Gerges announced that UNEP (OCA/PAC) was negotiating with the International Atomic Energy Agency (IAEA), Monaco, with a view to organizing an intercalibration exercise in the region, as deemed necessary. The Secretary IOC emphasized that this should be regarded as a co-operative effort and thus as a joint activity involving also IOC and ROPME. This was acknowledged by the UNEP Representative.

38 Dr. Makram Gerges also referred to the agreement between UNEP and MEPA under which UNEP provided financial support to MEPA to strengthen its capabilities in the field of remote sensing/satellite data analysis and interpretation with a view to assisting in training experts from the ROPME Region in this field of expertise.

39 Maintenance of equipment was singled out as often constituting a hinderance to project implementation and the training of technicians was deemed to be as important as training of scientists. Reference was in this context made to the training course on equipment maintenance by IOC, IAEA, FAO, UNEP and SAREC recently implemented in East Africa as a possible model to follow.

40 It was also pointed out that exchange of scientists between laboratories in the region for the purpose of gaining hands-on experience and sharing results was invaluable.

4. DATA MANAGEMENT

41 The Executive Secretary of ROPME referred to the presentation on this subject made by Mr. Mindert de Vries of Delft Hydraulics Laboratory to the *Ad hoc* Scientific Sub-Committee the previous day, which included aspects of data management during the MOUNT MITCHELL Cruise (see Appendix 4 of Annex I).

42 He confirmed that the database at the ROPME Secretariat was functionnal and under the management of a consultant from Delft Hydraulics Laboratory. He said it was urgent to identify a data center manager who would stay for at least a year and be able to train local personnel.

43 The Secretary IOC promised to continue to explore the possibility of getting a seconded expert through UNESCO's Associate Expert mechanism.

44 NOAA promised to join in the effort to identify an appropriate person on condition that ROPME or some other Agency would find the money to hire him.

45 The ROPME Executive Secretary informed the meeting that National Focal Points had been encouraged to set up databases in their individual countries to promote the exchange of data between the countries in the region and between the region and the international scientific community.

5. FINANCIAL SUPPORT (REGIONAL AND OTHER INTERNATIONAL)

46 The ROPME Executive Secretary informed the Committee that in spite of his best efforts, money for the execution of ROPME scientific programmes remains thin.

47 The UNEP Representative, Dr. Makram Gerges, referred to the efforts undertaken by UNEP and ROPME with regard to fund raising from the international community for the Consolidated Rehabilitation Programme (CRP), of which the Integrated Project Plan (IPP) constitutes the main component.

48 Various modes of raising money were suggested including a repeat of the high level three-man ROPME mission in the region in December 1991 that generated a lot of support for the MOUNT MITCHELL Cruise. It was agreed that though the Integrated Project Plan should be seen as an entity, it should be possible to package specific projects with limited financial implication for use in soliciting financial support from member states. Fisheries studies were identified as the first in this scheme and Dr. Faiza Al-Yamani was mandated to draft a project document on the basis of the work of the Task Force on the Japanese Cruise. Mr. John Robinson would identify a NOAA personnel to review the proposal.

49 It was also accepted that the Task Force on Finance should be re-activated.

6. IOC-ROPME CO-OPERATION

50 Two issues, Public Awareness and the Establishment of an IOC-ROPME Liaison Office in Geneva were discussed.

51 On Public Awareness, the Committee was informed that there is an elaborate UNEP-UNESCO Programme on Environmental Education which could be useful in generating Public Awareness within the region.

52 The UNEP Representative referred to the long-standing co-operation between ROPME and UNEP in the field of public awareness within the framework of UNEP support to the Kuwait Action Plan. He welcomed any initiative in this field under the UNEP-UNESCO co-operation in the area of Environmental Education and Training to further enhance public awareness in the ROPME Region.

53 The IOC Technical Secretary promised to explore in-house in UNESCO the best mechanism for achieving this campaign and to inform ROPME as soon as possible pointing out that both the UNESCO regional offices as well as the UNESCO national commissions would be actively involved in any programme aimed at raising public awareness on environmental issues in the region.

54 The Executive Secretary of ROPME said that in view of the communications/discussions between IOC and ROPME on the proposal to appoint a Liaison Officer who could serve as focal point between both Organizations and as co-ordinator for the implementation of the Integrated Project Plan

(IPP), it was suggested by ROPME that the liaison officer could be based in Geneva, with logistic support by ROPME such as office maintenance, travel, etc. and invited IOC to pay his/her salary.

55 The Secretary IOC responded that in the first instance IOC did not have the money to fulfill the role as it had not been included in the 1992/1993 budget. He added that even though he welcomed the idea of a liaison officer, he thought an appropriate location for such an officer if employed would be the ROPME Secretariat. He pledged to continue discussions on this proposal with the Executive Secretary of ROPME. H.E. Dr. Al-Awadi welcomed Dr. Kullenberg's suggestion and confirmed that ROPME Secretariat has no objection for the Liaison Officer to be stationed at the ROPME Secretariat in Kuwait as it will facilitate strengthening the present and future co-operation of both Organizations in implementing the Integrated Project Plan to rehabilitate the marine environment of the ROPME Region.

56 The IOC Technical Secretary informed the Committee that Mr. Peter Schroeder, Director of UNEP OCA/PAC, had expressed willingness during a visit to the IOC Secretariat in December 1991 to assist in the payment of the salary of such an officer if he/she was nominated by ROPME and if ROPME would undertake to pay the other expenses attached to the post.

7. CONSIDERATION AND ADOPTION OF THE REPORT

57 The report was adopted after due discussion.

8. CLOSURE OF THE MEETING

58 On behalf of the Joint Secretariat, the IOC Technical Secretary expressed his appreciation to Dr. Peter Dexter of the World Meteorological Organization (WMO) for the excellent arrangements made for the meeting. He also conveyed the gratitude of the Joint Secretariat to the Chairman, Dr. Nizar Tawfiq, for the excellent guidance he has provided to the activities of the Steering Committee for the Integrated Project Plan so far, and expressed the hope that he would continue in the same vein during the time span of the Plan.

59 The Chairman then thanked the members of the Steering Committee for a very productive meeting and appealed for their continued support in the future tasks identified in this meeting.

60 The Chairman closed the meeting by 10.30 a.m. on Thursday 18 June 1992.

ANNEX I

SUMMARY REPORT OF THE MEETING OF THE *AD HOC* SCIENTIFIC SUB-COMMITTEE FOR THE INTEGRATED PROJECT PLAN
Geneva, 16 June 1992

1. OPENING

Dr. Chidi Ibe, IOC Technical Secretary, welcomed the participants on behalf of the Joint Secretariat of the Meeting, ROPME and IOC, and informed them that Dr. Faiza Al-Yamani, IPP Project Co-ordinator and himself will co-chair while Mr. Ali Borham will serve as Rapporteur for the meeting.

He stated that the broad objective of the Sub-committee is to review in some detail the ROPME-NOAA-IOC Cruise on board the MOUNT MITCHELL and based on this review, to map out a preliminary scientific programme for the Scientific Meeting on the Cruise scheduled for January 1993 in Dubai, United Arab Emirates. The meeting will also dwell on the foci of future cruises (as presently identified) and streamline them to gain the maximum scientific information that will aid decision makers to take appropriate remedial actions and to formulate credible management plans for the ROPME Sea Area both at the national and regional levels. Data management aspects will also be discussed. Finally he pointed out that the meeting will review the Integrated Project Plan and re-define objectives and targets as deemed necessary. The recommendations from this meeting will be submitted to the 17-18 June 1992 meeting of the full Steering Committee for discussion and possible adoption.

The Sub-Committee was informed of the administrative arrangements and the Documentation for the meeting was introduced.

The Agenda/Timetable for the meeting was adopted with the addition of a discussion on Data Management.

The List of Participants is attached (Appendix 1).

2. REVIEW OF MOUNT MITCHELL CRUISE REPORT

Mr. John Robinson who co-ordinated the MOUNT MITCHELL Cruise informed the meeting, that the cruise report would not be ready before another month. He introduced the cruise data and sample inventory and called on the Cruise Leg Leaders or Co-Leaders who were present to give highlights of the undertakings and achievements during each of the Legs.

A summary of their reports including recommendations for further work is attached as Appendix 2.

Dr. Ibe expressed the concerns conveyed to IOC by some regional participants about the lack of quality control/quality assurance procedures in the physical oceanographic measurements, particularly in the First and Second Legs. Both Drs. Reynolds and Jerry Gault re-assured the meeting that as much as was feasible, intercalibration of measuring equipment was carried out on board and that further precautions are being taken in the treatment of the field data to ensure that any abberations in the results are eliminated.

3. PROGRESS IN THE NATIONAL (COASTAL) COMPONENT OF THE INTEGRATED PROJECT PLAN

Dr. Faiza Al-Yamani expressed regret at the lack of progress made in carrying out the national (coastal) component of the Integrated Project Plan. She said that this was due to a lack either of expertise or of equipment and that the problem differed from country to country. In addition, much of the attention of the scientists had been directed to participation in the MOUNT MITCHELL Cruise. She called for a re-definition of the areas of concentration of the national component of the Plan in the light of the knowledge gained during the Cruise.

Following discussions on this matter, the following were identified as subjects for further studies:

(i) **Coral reef studies:**

- state of health
- biodiversity/taxonomy
- extent of damage in Kuwaiti waters
- causes of damage.

It was stressed that this study required permanent monitoring stations to be set up to uncover why almost 99% of the corals in the area investigated showed signs of damage - they were either dying or dead.

(ii) **Inter-tidal zone studies:**

- degree of contamination
- persistence of contaminants
- treatment technologies and their effects
- monitoring
- nutrient cycling (sources/sinks etc. in the ROPME Sea Area).

(iii) **Water movements and characteristics:**

- how they affect the transport and distribution of pollutants,
- how they relate to the use of water for the desalination plants and for cooling in industrial facilities.

(iv) **Large scale dynamic processes:**

- investigate striking seasonal variability in temperature, salinity, etc.,
- monitor river and effluent outfalls.

(v) **Fisheries studies:**

- plankton dynamics
- pathological studies
- map in detail areas of fisheries productivity
- investigate the fauna and flora in productive areas
- nutrient cycling
- contamination levels.

A sub-group of regional scientists was set up to prioritize these identified scientific studies in the light of equipment and manpower situation in the region and to report on the outcome of their deliberations to the Full Committee the next day.

4. FUTURE OCEANOGRAPHIC CRUISES

It was agreed that most of the elements identified as important to the coastal component would also constitute themes for future oceanographic cruises.

Dr. Mohammed Hassan, Task Force Leader for the MUKTABAR ALBIHAR Cruise for 1992 summer informed the meeting of the scientific plan for the cruise which is a compressed version of the plan mapped out during two scientific meetings of the Task Force in October 1991. The cruise will take place 5 - 30 September 1992 and the crew for the ship will be available by 15 August 1992. He presented a "Shopping List" (Appendix 3) needed for the successful implementation of the Plan. NOAA indicated the possibility of lending some of these requirements for the cruise to MUKTABAR ALBIHAR, including one of the small boats on MOUNT MITCHELL, as well as to identify a data processing manager for the cruise.

It was stressed that ROPME, IOC, UNEP and other UN agencies should stand ready to make up for any shortfall in equipment and expertise to ensure that the cruise takes place as scheduled.

Dr. Ergun, Scientific Officer of the Oceanographic Network for Islamic Countries (INOC), informed the meeting of the readiness of the Network he represents to make available a research vessel for a cruise in 1993, and to provide men and materials as required for the cruise. He named two oceanographic research vessels belonging to Turkey (the Pre-rers (37m, 300 t.) and Bilin (42m, 400t)) that would be readily available indicating that Turkey as a country had already offered the IOC the use of one of these vessels for a future cruise (preferably 1993) in the ROPME Sea Area. He said resources required for the cruise could be solicited through the Permanent Scientific Committee for Islamic States which is a high level ministerial committee. Each boat would take 12 scientists and has a staying (at sea) power of 2 weeks. The meeting agreed to schedule a cruise in summer 1993 predicated on this offer.

The IOC Technical Secretary then presented details of a cruise offered by the Japanese Government through IOC. The vessel belongs to the Tokyo University of Fisheries and the Chief scientist will be Professor A. Otsuki. The cruise details are as follows:

(i) Research area: southeast part of the Gulf (east of 51 E, south of 28 N),

(ii) Research period: 13 - 26 January 1993,

(iii) Port of Call (pick up and disembarkation): Dubai, United Arab Emirates,

(iv) Stations: 30 stations, namely serial nos. 41-46, 48-53, 61-69, 91-94, as reflected in Annex IV of the Report of the ROPME/IOC Meeting of the Steering Committee organized in co-operation with UNEP (Kuwait, 24 - 27 September 1991),

(v) Research Topics:

- CTD observations
- sampling of water, sediment, plankton
- measurement of basic productivity
- fisheries research
- cross check MOUNT MITCHELL results.

The ship will take 7 scientists from the region and one or two international researchers to be identified by ROPME and IOC. The ship is being offered on all expenses paid basis except for the travel costs of ROPME-IOC identified participants to and from Dubai, United Arab Emirates.

It was suggested that the primary focus of this cruise will be fisheries research.

Two other tentative offers of platforms were announced. One by the National Institute for Oceanography, GOA, India, possibly for winter 1993/94 and a JGOFS related cruise possibly about the end of 1995.

5. ESTABLISHMENT OF AN INTERNATIONAL SCIENTIFIC CRUISE COMMITTEE

The ROPME Executive Secretary had proposed the establishment of an International Scientific Cruise Committee. The general feeling was that such a committee would be superfluous. It was agreed that the Steering Committee could perform this function and set up Task Forces as and when necessary to run specific cruises.

6. ORGANISATION OF THE ROPME-IOC MEETING IN DUBAI IN 1993

The focus of this meeting will be the MOUNT MITCHELL Cruise and results therefrom. The meeting is planned for 24 - 28 January 1993 in Dubai, United Arab Emirates. The Secretary IOC explained that this will constitute an expanded meeting of the Scientific Committee ahd that an International Conference to review the entire Integrated Project Plan is planned for Tehran, Islamic Republic of Iran, in the last quarter of 1993. The planning of the Tehran Meeting is already in progress.

Four main themes around which discussions at the Dubai Meeting would be structured are as follows:

(i) large scale physical dynamic processes,
(ii) coastal - nearshore processes,
(iii) coral reefs,
(iv) fisheries and plankton ecology.

Commander Cava's suggestion to invite one or two "outside" presentations, e.g. by the World Meteorological Organisation, that will put the MOUNT MITCHELL results in their proper perspective was accepted.

It was decided that Drs. Robert Clarke and Faiza Al-Yamani should be responsible for the overall scientific co-ordination.

15 November 1992 was set as the deadline for the receipt of abstracts and 1 January 1993 for the receipt of full papers.

An Organising Committee was constituted as follows:

Badria Al-Awadi - ROPME
Chidi Ibe - IOC(UNESCO)
Makram Gerges - UNEP
John Robinson - NOAA
Senior Scientist from the host country

A sub-group was set up to draft the announcement for the meeting and present it for the approval of the Full Committee.

7. DATA MANAGEMENT

Mr. Mindert de Vries gave a presentation on the status of data management for the MOUNT MITCHELL Cruise and informed the meeting that Delft Hydraulics Laboratory was still involved in the management of the Data Center in ROPME Secretariat on contract (Appendix 4).

The IOC Technical Secretary informed the meeting that IOC had identified a Belgian National who had been initially ready to take up the job of Data Center Manager, but had telephoned the previous week to this meetting to decline the offer for family reasons. The search would continue. IOC would explore the possibility of using the UNESCO associate expert mechanism to secure the employment of any person identified. If not, IOC's role will end after the identification of the appropriate personnel.

8. REVIEW OF THE INTEGRATED PROJECT PLAN

The meeting was of the opinion that the Updated Integrated Project Plan as originally conceived is still as relevant in the post MOUNT MITCHELL Cruise period as it was before. The meeting emphasized the need to pursue the outstanding aspects of the Plan, particularly as outlined during this meeting. The need to maintain the momentum generated by the MOUNT MITCHELL Cruise was stressed.

9. CLOSURE

The Co-Chair thanked participants for their contributions to the success of the meeting and closed it by 6.30 p.m on 16 June 1992.

APPENDIX 1

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APPENDIX 2

SUMMARY OR ACHIEVEMENTS DURING THE MT. MITCHELL CRUISE AND SUGGESTED FUTURE WORK

The following very brief summary, provided by the NOAA Leg Leaders/Co-Leaders abstract the Mt. Mitchell Cruise accomplishments and highlights suggested follow-on programmes. For a more complete description of the cruise, please refer to the draft cruise leg reports that are available.

LEGS I, III, AND VIA/B -- PHYSICAL OCEANOGRAPHY

The overall goals of the physical oceanography program were: (1) to complete two comprehensive CTD surveys of the entire ROPME Sea Area (RSA), one in the winter (Leg I) and one in the early summer (Leg VI); (2) to define the residual currents in the RSA, (3) to better understand the Iranian coastal circulation which is driven primarily by fresh water runoff; (4) to relate surface currents to local forcing; and, (5) to intercompare models of the circulation with actual measurements.

Major portions of the ROPME Sea are hypersaline and on the average evaporation exceeds precipitation and river runoff. This gives the area it's negative estuary characteristics, which are evident in the hydrographic station data collected during LEG I of the cruise. The overall or large scale thermohaline balance is modified locally in a few regions where there are rivers that flow into the sea. For these areas the incoming fresh water does influence the flow and provide small pockets that tend to act more like positive estuaries.

During Leg I the following activities were conducted: (1) A complete CTD survey with over 112 stations throughout the RSA and additional calibration casts was completed. (2) Seven current meter moorings with 1 to 4 meters distributed through the water column. (3) Twenty-six Argos-tracked drifting buoys were deployed to provide a Lagrangian description of the surface water circulation. (4) Sediment samples were taken at most of the CTD stations.

The basic objective of the LEG III program was to investigate the influence of a few of fresh water runoff areas off the RSA. Pre-cruise analysis of space photographs of the ROPME Sea were used to target areas where there as evidence of near shore mixing and shallow stratification. These target areas were all along the Iranian coast and a sampling plan was developed where a dense grid of CTD stations was set up so that the sample density was adequate to resolve the features indicated in the space photographs. As the ship approached and/or left these operational areas a series of stations (CTD and bottom grabs) were taken to provide data to tie the small-scale, densely sampled grids to the large-scale synoptic data that was collected on LEG I and planned for collection on LEG VI.

While the ship was in each of the operational areas the two Jensen launches were to be used for additional non-physical investigations carried out by the LEG III scientific crew. These were to include plankton tows, diving inspections of the benthic communities, collection of tissue samples, sediment grab samples for microfauna and meiofauna and sediment grab samples for hydrocarbon and additional chemical analysis.

During Leg VI, the following activities were conducted: (1) the CTD array was repeated with some additional stations in the Gulf of Oman. (2) The current meter moorings were recovered--two moorings were lost, but all the remaining moorings were in recovered in good working order. (3) Four additional drifter buoys were deployed in the Gulf of Oman. These were four different types of buoys and were deployed in the same place

and time to compare the different characteristics of the designs. (4) Seawater light transmittance was measured at selected stations. (5) Nano-plankton measurements were made from water collected at the surface for all CTD stations, and from depth at all stations taken by the ship.(6) Additional sediment samples were taken in order to complement the survey taken in Leg I.

SUGGESTED FUTURE WORK IN PHYSICAL OCEANOGRAPHY

The physical oceanographic measurements have made a major step forward in the understanding of the scale and scope of the major features in the RSA. However, the measurements point to future works which will continue to fill in the information deficit of this important area. Suggested work is as follows:

1. CTD Measurements. Continue to take CTD stations at different times of the year. Focus on sections C,D,E,I, and P as a standard set of stations and take CTD measurements from these stations on a regular basis; whenever possible. In this way a data base on a climatic scale will develop.

2. Iranian coastal measurements. Monitor river outflow effluent and take additional CTD stations in the intensive areas from Leg III.

3. Instrumentation. Good quality CTD instrumentation and small boats (RHIB or Whaler) should be procured and maintained in a calibrated, ready-to-use condition so CTD surveys can be made on a monthly basis. Weather stations with real-time satellite output should be deployed and maintained in good operating condition.

4. Acoustic doppler current meters . An understanding of the circulation through the Strait of Hormuz is of utmost importance. Because of the intensive shipping and fishing in this region, ordinary current meter moorings are not practical. We strongly recommend that at least two acoustic doppler current meters be purchased and deployed in the Strait for a prolonged time. The current meters can be fitted into a sturdy bottom fixture where they will be able to measure currents over the entire depth in relative safety.

Leg II - NEARSHORE PROCESSES STUDIES

Leg II consisted of thirteen interrelated studies on the biogeochemical processes in nearshore environments, focusing on the heavily oiled bays of Dawhats ad Daffi, Musallimiyah, and Tanaqib. Extensive sample collections and field observations were made at 36 intertidal transects, 16 intertidal sites, and over 150 locations in the subtidal zone. Habitats studied included seagrasses, fine-grained mud bottoms, coral reefs, sargassum meadows, rocky bottoms, tidal flats, sand beaches, mangroves, halophyte marshes, and algal mats. Water column studies included plankton, chlorophyll, microbial degradation, and petroleum hydrocarbons. A small number of fish and over 60 sea pens were collected for histopathological study. Over 350 sediment samples (intertidal, subtidal, suspended) were collected, including 79 diver-collected sediment cores, for analysis of trace metal and petroleum hydrocarbon content. A total of 197 dives were conducted, current meters were placed in three of the main channels in the bays, and sediment traps were deployed at seven locations.

Preliminary results of the studies conducted during Leg II are:

1. The intertidal zone remains very heavily oiled, with little natural removal occurring in the sheltered habitats.

2. The oil has penetrated deeply into the intertidal sediments, which will slow even further natural removal and weathering.

3. There was no evidence of large-scale sinking of the oil slicks; in all of the dives, the only visible oil one year later was in the form of tar balls at the bottom of three channels.

4.There is extensive contamination of fine-grained subtidal sediments, via erosion of the intertidal oil. This subsurface contamination most commonly occurred in the top 5 centimeters.

5. The seagrass beds appeared to have either not been impacted or have already recovered, one year later. No studies were conducted on the associated fauna.

Recommendations for On-going Studies

1. Studies should be undertaken to test the effectiveness and effects of various shoreline cleanup methods, with emphasis on the sandy tidal flats which have heavy oil residues to depths of up to 50 centimeters and in muddy tidal flats were oil has penetrated and pooled in burrows. Natural recovery in these settings will be extremely slow, with the potential for long-term degradation of the habitats through the formation of pavements. However, prior to large-scale sediment removal or re-working, or other techniques, field tests should be conducted with detailed monitoring of the effectiveness of the technique and potential negative impacts, through comparison of treated versus control sites. These studies should be conducted immediately, before the oil weathers to the point that further cleanup is no longer effective.

2. A better understanding of nutrient cycling, of the sources and sinks of nutrients in the Gulf is critical to assessment of the impacts from the spill and the development of mitigation measures. The relative contributions of plankton, seagrass beds, benthic invertebrates, algal mats, and land-based sources needs to be determined, as well as the linkages between these sources. Since the Gulf is nutrient limited, such studies are critical to long-term management of the living resources of the Gulf.

LEG IV - FISHERIES RESEARCH

Leg IV consisted of several integrated projects to investigate the extent of contamination, levels of exposure, and stresses on plankton communities and on selected species of fin fishes, shrimps, and benthos from petroleum pollution, especially from the 1991 oil spills in the northwestern RSA. Emphasis was placed on the subtidal marine communities along the western side of the RSA. During the leg, eight sites were sampled representing broad geographic, resource, and habitat type. Fish were collected by demersal trawls, hook and line, and fish traps. The catch was sorted as to species, with individuals of

selected fish examined as to length and weight. Liver, bile, otoliths, and muscles of fish were excised and stored frozen for hydrocarbon and trace metal analysis. Shipboard analyses using high performance liquid chromatograph in bile samples provided evaluation of exposure of fish to residual aromatic hydrocarbon pollution.

LEG V - CORAL REEF ECOLOGY

Leg V consisted of several integrated projects to investigate the extent of contamination, levels of exposure, and stresses on plankton and reef communities and on important selected species of coral reef fishes, shrimps, and mollusks and benthic plants from petroleum pollution. The emphasis of this leg was evaluation of the impact of the oil spill on coral reef ecosystems.

Over 170 dives were completed at 7 stations sailing north from Qatar to Kuwait. Generally, the offshore coral reefs were found to be in better condition and had greater diversity and abundance of fish, corals and plants than those in near-shore areas. The more northerly stations and those closer to shore were found to be in poor health. At Qit'at Urayfijan reef, over 80% of the corals were observed to be dead or dying. At Taylor Rock, all *Acropora* and a few massive corals were found to be dead or bleached. A post-cruise dive was arranged at Jazirat Kubbar Reef, approximately 50 miles offshore from Kuwait City, a site visited during October 1991 when the reef appeared to be in good condition. In May, the corals, especially *Acropora*, were found to be dead, bleached or in generally poor condition. The reasons for these findings could not be determined by this cruise. Direct impact of oil on coral reef communities was not observed.

Recommendations for follow-on projects:

1. Scientists familiar with local corals are strongly encouraged to embark upon an immediate and thorough comparison of the condition of the Kuwait reefs with pre-1991 conditions. Video and photo documentation should be used to document current conditions and to allow long term observation.

2, Permanent stations should be established and comprehensive studies should be initiated around the region (e.g. community structure, diversity, physiological studies). Continued monitoring, recommended on a quarterly basis, is needed for the coral reefs. Special attention should be given to monitoring reproductive activity for *Acropora* and other corals. Reefs should be selected in priority areas both in proximity of potential pollution sources and in remote areas. Monitoring stations to measure water column parameters such as temperature and salinity and sedimentation rates should be established and sampled on a regular basis.

3. The offshore islands should be "protected". They may provide the only healthy ecosystems for recolonization of impacted areas.

APPENDIX 3

MUKHTABAR ALBIHAR CRUISE
LIST OF ADDITIONAL EQUIPMENT

Needed equipment and material in addition to what exists in Qatar University:

1	folio of navigational charts for the Gulf
1	fax machine for the ship'telephone
2	one attached GPS (with printer) and one hand held GPS
2	interfaces between CTD acquisition system (guideline) and computer
1	microcomputer and printer and software
1	salinometer (high salinity)
1000m.	PVC coated hydrowire 6mm diameter
500	polyethylene or polypropylene bottles 500 ml
100	glasses stoppered BOD bottles cap. 100 ml
5	Niskin PVC bottles, 5l. capacity
2000	each size plastic bags (sealing types, different sizes)
200	plastic bottles with screw caps (cap. 100ml)
1	UV visible double beam or single beam spectrophotometer (200 - 1000 n.m. wavelength) with 1, 5, 10 cm length cuvettes assembly and cuvettes (portable for shipboard work)
1	automatic digital titrator capable of dispersing 01 ml solution (metrohm doxsimeter type)
1	small bench type water purification system - multipore or any make capable of producing millipore quality water on demand Unit complete with two centrifuge units + 2 extra cartridges
4x2	boxes automatic Eppendorf repeater pipettes with different capacities.

APPENDIX 4

A SUMMARY OF STATUS OF DATA MANAGEMENT FOR THE MOUNT MITCHELL CRUISE

Delft Hydraulics seconded a project team of four experts to assist in data storage and management during leg II of the ROPME-NOAA-IOC Cruise. These activities were jointly funded by the Dutch Government, NOAA, IOC and ROPME. The activities of the project team focussed on data-entry, data exchange and training of scientists. This mostly shore based team was provided excellent office space by MEPA in Jubail and was housed in the CEC experts housing facility. Its activities were successfull due to an excellent co-operation between all organizations involved. Data from other legs were entered in close co-operation with NOAA and regional scientists. Details are documented in the Status Report of Data Activities provided to IOC-NOAA and ROPME.

At present, activities are focussed on extension and completion of the data being available in the ROPME Data Centre. Delft Hydraulics provided an expert data system manager for ROPME to facilitate these activities. Concerted efforts of ROPME-NOAA-IOC and Delft will ascertain that all cruise data will be available in the data center in due time. In the meantime, proposals have been issued to ROPME member states in order to provide as soon as possible peripheral data systems. These systems will possibly contain data already made available from the cruise. Until now specific requests have been made by EPC/EPD - KISR (Kuwait) and MEPA (Saudi Arabia).

The Sub-Committee recognised the central role of data management as a means to maximize effectiveness of the present and future cruises. A need for intensified communication and data exchange was identified. This could early be realized by a kind of newsletter, formalised data exchange formats (MEDI?) and regular training and workshops at ROPME. As a final step a comprehensive data inventory should be produced by ROPME, identifying data status, data sources and data characteristics.

In future, data management should play a central role, co-ordinated by ROPME, in the assessment of environmental quality in the ROPME Sea Area.

PS. Future prolonged involvement of Delft will need a substantial amount of funding.

ANNEX II

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ANNEX III

REPORT OF THE SUB-GROUP TO PRIORITIZE OUTSTANDING WORK IN THE ROPME REGION

Knowing that the long term environmental effects of the war may lead to enormous irreversible changes, and taking into consideration the regional capabilities (eg. manpower, resources, etc.) and the importance of the items proposed to be monitored on a long term basis, it was decided that some activities should be carried out regionally by ROPME-IOC-UNEP and other organizations, while other activities are to be carried out as part of the routine monitoring activities of ROPME Member States.

A. COASTAL COMPONENT

I. REGIONAL ACTIVITIES TO BE CARRIED OUT BY ROPME

1. Training
2. Intercalibration exercises
3. Utilization of satellite imagery service.

II. MEMBER STATES RESPONSIBILITIES (COASTAL COMPONENT)

1. Fisheries landing statistics,
2. Fish diseases survey (economically impacted fishes): needs outside expertise,
3. Sea food safety - pollutants in fish (lead, Vd, Cd), total hydrocarbon,
4. Water quality (sal, temp, D.O., PH, POU, NO3, NO2, NH4, SIO3),
5. Intertidal zone,
6. Occurrence of a distribution of dominant intertidal organism down to Genera (eg. molluscs, crabs, worms, etc.),
7. Type of substrate, and granulometric analysis if applicable,
8. Pollutant analysis in sediment,
9. Assessment of coral community,
10. Mangrove ecosystem
11. Benthic community (fauna, flora),
12. Planktonic community and productivity,
13. Nearshore sediment transport,
14. Amount of fresh water input into the northern ROPME Sea Area.

III. SAMPLING STRATEGY

Physical studies with emphasis on the sampling stations as specified in previous ROPME reports.

Bimonthly: starting this September 1992.

B. OCEANOGRAPHIC CRUISES

Provisional schedule:

1.	Mukhtabar Al-Bihar	:	5 September 1992 - 30 September 1992
2.	Japanese Vessel	:	13 - 26 January 1993
3.	Turkish Vessel	:	summer 1993
4.	Indian offer	:	to be finalised by IOC: December 1993/January 1994
5.	JGOFS	:	1995 (possibly)

C. PRIORITIES

1. Physical oceanography (CTD, current studies, drifters)
2. Fisheries
3. Plankton and productivity
4. Nutrient and water quality
5. Sediment sampling (core samples).

ANNEX IV

ANNOUNCEMENT FOR THE EXPANDED STEERING COMMITTEE SCIENTIFIC MEETING ON THE MOUNT MITCHELL CRUISE - AL-AIN (UAE), 24 - 28 January 1992
(100 Day Oceanographic Cruise of the ROPME Sea Area NOAA Ship MOUNT MITCHELL, February-June 1992)

The MOUNT MITCHELL 100 Day Oceanographic Cruise provided a regional synoptic view of oceanographic processes in the ROPME Sea Area and conducted a series of interdisciplinary studies that investigated the impact of the 1991 oil spills in the ROPME Sea.

This workshop organised by the Steering Committee for the implementation of the ROPME-ICC Integrated Project Plan will provide the first public forum to present and discuss the results of the MOUNT MITCHELL Cruise and to prepare an interdisciplinary synthesis of the cruise data.

The workshop will include four major sessions:

(i) Large Scale Dynamics:
Michael Reynolds and Mohammad Sheikholeslami, Session Co-ordinators.

(ii) Fisheries/Plankton Ecology:
Sylvia Earle and Yousef Fadlallah, Session Co-ordinators.

(iii) Nearshore Processes:
Assad A.M. Al-Thukair and Jacqueline Michel, Session Co-ordinators.

(iv) Fisheries/Plankton Ecology:
Session Co-ordinators
Robert Clark and Omar Hashim

Abstracts and final manuscripts must be submitted by all speakers to the appropriate session co-ordinators listed above. Guidelines for preparation of abstracts and manuscripts will be distributed to all cruise participants by the session co-ordinators. The schedule for submission is:

(i) Abstract deadline: 15 November 1992

(ii) Final Manuscript Deadline: 1 January 1993

(iii) Workshop Organisers: Badria Al-Awadi (ROPME) - Makram Gerges (UNEP) - Chidi Ibe (IOC/UNESCO) - Saad Al-Numery (UAE) - John Robinson (NOAA).

(iv) Scientific Directors:

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