Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC-UN (OALOS) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources (OSNLR)

Third Session

Bordeaux, France, 21-25 February 1989

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)*
12. Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica *(Spanish only)*
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources *(Also printed in French and Spanish)*
25. Third Session of the IOC Group of Experts on Effects of Pollutants
26. Eighth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
27. Eleventh Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans *(Also printed in French)*
28. Second Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
29. First Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities *(Also printed in Spanish)*
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System
34. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
35. Fourth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
36. First Consultative Meeting on RNODCs and Climate Data Services
37. Second Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow
38. Fourth Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
39. Fourth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
40. Fourteenth Session of the Joint CCOP-IOC Working Group on Post IDOE Studies of East Asian Tectonics and Resources
41. Third Session of the IOC Consultative Group on Ocean Mapping
42. Sixth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of « El Niño » *(Also printed in Spanish)*
43. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean.
44. Third Session of the IOC-UN (OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources

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SC-89/WS/31

TABLE OF CONTENTS

Page

ANNEXES

1. OPENING

1 Following the welcome address of Mr. Albert Massiah, Secretary General, Comité d'Expansion Aquitaine, the Chairman of IOC-UN/OALOS[1] Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR), Professor Michel Vigneaux, opened the Third Session of the Guiding Group of Experts on the Programme of Ocean Sciences in Relation to Non-Living Resources (OSNLR) at 0900 hours on Tuesday, 21 February 1989, in the Meeting Room of the Comité d'Expansion Aquitaine, Bordeaux (France). He welcomed the participants, particularly those new to the Group, and introduced Professor Jacques Valade, former Minister of Research who welcomed the participants in his capacity as First Assistant to the Mayor of Bordeaux, and stressed the interests of the City of Bordeaux and of the Aquitaine region in the utilization and development of its coastal area, particularly in the development of industries and living resources. The Chairman pointed out that, due to the interest of the region of Aquitaine in the activities of Unesco and IOC in the field of ocean sciences, the Mayor of Bordeaux, Mr. Jacques Chaban-Delmas, invited the Director General of Unesco to hold the Session in Bordeaux. He expressed his appreciation to the Mayor of Bordeaux and to the Secretary-General of the Comité d'Expansion Aquitaine for offering the opportunity to hold the Session in Bordeaux.

2 Referring to the Terms of Reference of the Guiding Group, the Chairman explained that the main purpose of the Guiding Group is to: plan the future development of the OSNLR programme, paying attention to methodological, technological and logistical aspects; provide scientific and technical advice to IOC regional subsidiary bodies involved in the implementation of regional components of ONSIR; and seek the co-operation with appropriate international bodies.

3 On behalf of the Secretary of IOC, Dr. Gunnar Kullenberg, who was unable to join the opening session, Dr. Kazuhiro Kitazawa, Assistant Secretary IOC and Technical Secretary for the Session, welcomed the participants and thanked the Mayor of Bordeaux for the kind invitation to hold this Session in Bordeaux and the Comité d'Expansion Aquitaine for the valuable contribution in organizing the Session.

4 Mr. Robert Gruszka, the Representative of UN(OALOS), welcomed all participants on behalf of the co-sponsoring Agency of the OSNLR Programme, and thanked the Comité d'Expansion Aquitaine for their hospitality and excellent arrangements.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

5 Dr. Claude Latouche, IOC Consultant, introduced the Provisional Agenda. The Guiding Group, after agreeing to some amendments, adopted the Agenda for the Session (Annex I).

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[1] A list of Acronyms and Abbreviations is provided in Annex IV

2.2 DESIGNATION OF A RAPPORTEUR FOR THE SESSION

6 Dr. Peter Hale accepted the invitation to serve as Rapporteur for the Session.

2.3 CONDUCT OF THE SESSION

7 Dr. C. Latouche informed the Guiding Group of the arrangements for the Session and introduced the Working and Information Documents.

8 The IOC Assistant Secretary informed the Guiding Group that both UN(OALOS) and IOC had been unable to contact Dr. Luis Martins (Brazil) and that Dr. Michael Collins (UK) was unable to attend the Session due to other commitments. The List of Participants is given in Annex III.

3. OVERVIEW OF INTERSESSIONAL ACTIVITIES

9 The Representative of the UN(OALOS) briefly recalled the consolidation of marine affairs activities at United Nations Headquarters, New York, in the new Office for Ocean Affairs and the Law of the Sea (OALOS) with ongoing activities regarding legal aspects of marine affairs, as well as the economic and technical aspects previously carried out by the OETB.

10 The 1982 U.N. Convention on the Law of the Sea provides a comprehensive legal framework for the development of all marine resources and uses of the oceans and the OSNLR Programme and the work of its Guiding Group certainly falls within the purview of the new legal regime for the oceans. A significant component of the Office's activities is aimed at promoting the universal acceptance of uniform and consistent application of the Convention. As far as the OSNLR Programme is concerned, the work of the Preparatory Commission for the International Sea Bed Authority and the International Tribunal for the Law of the Sea, which UN(OALOS) services as the Secretariat, is directly relevant to the deep sea component of the Programme. As for the shallow-water component of OSNLR Programme, the representative of UN(OALOS) drew attention to his Office's activities regarding near-shore minerals, particularly in assessment and development of coastal areas and as regards policy formulation, planning and management in the EEZ. The concept of coastal zones as resources (CZAR), developed at the Second Session of the Guiding Group, takes into account the Office's approach to coastal/EEZ planning and management.

11 The Representative of UN(OALOS) introduced the report of the Secretary-General on the Law of the Sea, which his Office had submitted to the U.N. General Assembly at its Forty-third Session in 1988. This report, prepared annually, describes important developments and issues in marine affairs generally, including legal, economic and technical aspects, and then reviews the activities of the Office.

12 Referring to the report (Document: IOC/INF-744), of the Meeting of OSNLR Officers, (Paris, 2-5 March 1988), Dr. Peter Cook, Vice-Chairman of the Guiding Group of Experts on OSNLR, summarized intersessional activities developed on the basis of priorities identified at the Second Session of the Guiding Group (Paris, 26-30 January 1987), and the recommendations. He

recalled that the programme has been focused on the shallow water (SETR sub-programme) since the programme started. Besides mineral resources e.g., placers, sands, gravel, carbonates, phosphorites, special attention was given to the coastal zone as a resource (CZAR) in its own right. The Guiding Group recommended, at its Second Session, the study of natural and human effects on the coastal and shelf zone, the mapping of the distribution and composition of superficial shelf sediments including world-wide delineation of strand-lines of the last low (18,000 years BP) and high (125,000 years BP) still-strands. In order to facilitate development of the programme, the Guiding Group also recommended that an effort should be made to involve developing countries through the following actions: (i) formation of regional groups of experts; (ii) training activities; (iii) involvement in deep sea drilling cruises and/or pre- and post-cruise studies.

13 Dr. Cook reported that regional groups of experts are formed or are under formation in regions of IOCARIBE, WESTPAC, IOCEA and IOCINDIO, as well as in the south-west Atlantic (see section 4). In addition, IOC is jointly sponsoring working groups on studies of tectonics and mineral resources with CCOP and CCOP(SOPAC). A joint working group is also under consideration with CPPS.

14 He stressed that due to limited funds, it is essential to avoid any duplication and to co-operate with other groups and programmes related to OSNLR, such as IGCP. A training course on Phosphorites and Offshore Mineral Exploration in the South-West Atlantic was held in Porto Alegre (Brazil), 7-11 November 1988 in co-operation with IGCP Project No. 156 (Phosphorites). Other possible ways of co-operation with IGCP appeared through the development of a newly adopted IGCP Project 274: "Quaternary Coastal Evolution, Case Studies, Models and Regional Patterns", and with Unesco through the planned sub-programme on Quaternary Geosciences for Human Survival in Southeast Asia (section 5.1).

15 Dr. Cook recalled that the role of the Guiding Group is to develop the programme and provide advice for its implementation and give assistance towards approaching possible funding agencies.

16 **The Guiding Group noted** that various relevant activities are carried out by both UN(OALOS) and IOC. **It requested** that consideration be given to more training opportunities, in the form of group training, on relevant topics of the OSNLR Programme, particularly those related to mineral resources.

17 **The Guiding Group noted** the need of geological exploration in the intermediate zone between the coastline and the continental shelf. It underlined the need to develop complete transects and geological mapping from the land to the sea, in order to elucidate on a geological basis specific questions such as: sedimentary dynamics, environmental impacts, inventory of mineral resources. **The Guiding Group pointed out** that projects relevant to polymetallic nodules need to be initiated within the deep-sea sub-programme.

18 The Guiding Group noted, with satisfaction, actions taken by experts from the regions of IOCARIBE, WESTPAC and IOCEA to identify and initiate potential regional projects relevant to the OSNLR Programme. It welcomed these initial actions and encouraged regional co-ordinators to set up a workplan and to initiate the implementation as soon as possible.

19 The Guiding Group recommended the Secretary IOC to consider possible ways and means to encourage such regional movements by providing financial assistance to enable them to initiate their activities.

4. IMPLEMENTATION AT THE REGIONAL LEVEL DURING THE PAST INTERSESSIONAL PERIOD

4.1 CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)

20 Dr. Adolfo Molina-Cruz, Co-ordinator for the IOCARIBE region, summarized the current activities in the region.

21 An International Course on The Knowledge and Management of the Coastal Zone and Near Continental Shelf in the Caribbean was jointly sponsored by the French Government and IOC in Cartagena, (Colombia), from 18 May to 3 June 1988, (IOC Training Course Report No. 10), with fifteen participants from eleven Member States in the region. During the Course, three days (31 May to 2 June 1988) were devoted to review the current situation on activities in the region related to the OSNLR Programme and to draft research proposals (Document: IOC/INF-782), concerning non-living resources in the Caribbean. The Course identified the following themes to focus attention on the region:

(i) Flow of water and continental material to the sea: study and evaluation of its impact on coastal systems and on the continental shelf;

(ii) Evolution of the coastal strip in beach zones of the IOCARIBE region;

(iii) Management of coastal ecosystems and prospects for overall planning in the IOCARIBE region.

These themes are also identified by the Guiding Group at the Second Session, and the IOCARIBE Mini-Symposium for the Regional Development of the IOC-UN(OETB) Programme on OSNLR, Havana, Cuba, 4-7 December 1986 (IOC Workshop Report No. 48). The mini-symposium recommended that research on these themes be carried out in selected pilot areas to be chosen taking into account available facilities. At present, studies on the first theme are carried out in Mexico and Colombia, while studies on the second and third topics are carried out in Cuba.

22 The participants in the Course felt that an inventory of human resources, as well as facilities available in the region would be the basic document to develop a workplan. They recognized that due to lack of marine

geologists in the region close co-operation with scientists from outside the region is essential to lead the Programme to success. Development of local technology must be encouraged. The preparation of a guide on how to establish basic equipment (dredges, gravity cores, hydrographic bottles) should be considered.

23 The Regional Co-ordinator pointed out that there are some difficulties to implement immediately all the themes endorsed at the Course due to the lack of trained personnel within the region, but nevertheless since the Second Session of the Guiding Group the following progress was made:

(i) Preparation of bathymetric charts of the region is underway by the Institute of Geography in Mexico, with the assistance of a French organization. Geomorphological charts are planned.

(ii) Investigations of the coastal zone, particularly on beach dynamics and monitoring started in Cuba.

24 The Guiding Group acknowledged efforts made by the Regional Co-ordinator and noted that the regional group decided to concentrate its efforts on coastal projects in the initial stage due to the limited resources available to carry out the proposed projects.

25 The Guiding Group requested the Regional Co-ordinator to take necessary action to initiate limited regional projects for co-operative research. It recommended IOC to provide assistance to the Regional Co-ordinator to initiate the projects in the region.

26 The Guiding Group recommended the Regional Co-ordinator to prepare, in collaboration with the IOCARIBE Secretariat, a list of planned research cruises in the region and of their potential investigators.

27 The Guiding Group also recommended that both UN(OALOS) and IOC consider providing training opportunities to scientists in the region and that IOC contact the National Science Foundation (NSF) of the United States of America and seek their support to the OSNLR Programme in this region.

28 Recognizing the need to increase the number of trained personnel in the IOCARIBE region, the Guiding Group recommended that IOC support the participation of IOCARIBE scientists in the on-going oceanographic projects, in order to facilitate relevant training.

4.2 WESTERN PACIFIC

29 Professor Wang introduced the Workshop on Marine Geology in the WESTPAC Region, Shanghai (China), 7-11 September 1988. The Workshop developed a set of sub-projects under the framework of studies on (i) Palaeogeographic Mapping and (ii) the Margin of Active Plates together with a detailed workplan to implement them.

30 After careful examination, the Guiding Group noted that six sub-projects related to palaeogeographic mapping are relevant to the OSNLR Programme, but some of them are too local and it is difficult to expect wide participation of scientists from the WESTPAC region. It recommended the regional group to focus its efforts on a generalized co-operative research project with an objective to compile a series of maps of the sea-floor and coastal zones.

31 The Guiding Group adopted Recommendation OSNLR-III.1 and recommended IOC to urge WESTPAC Member States to take the necessary action to implement the project.

32 Regarding the topic on margins of active plates, five sub-projects were proposed by the regional group at the Workshop with a well-documented workplan. However, sub-projects covered a wide scope and the Guiding Group recommended the regional group to initiate its research work on a single project in which scientists from the region could participate.

33 The Guiding Group adopted Recommendation OSNLR-III.2.

34 The Guiding Group pointed out that the success of the project stated in this Recommendation is totally dependant upon the provision of ship time and access to high level technology. Therefore it requested Professor H. Kagami, Co-ordinator for the WESTPAC region, to ensure availability of research vessels and to set-up a precise research time schedule according to ship time. It also recommended IOC to call on its Member States interested in WESTPAC marine geology to offer ship time for this project.

35 Drs. Cook and Kitazawa reported on recent developments of SEATAR. This programme is now in the final stage and for over a decade thirteen geological transects, out of which ten are marine basin studies, have been carried out. At its Fourteenth Session held in Baguio City (Philippines) on 8 to 11 December 1988, the Working Group carefully reviewed the status of the final report, including map presentation for these transect studies. The analysis of data and subsequent drafting of transects are being carried out by the geological surveys of the relevant Member States and drafts of the transect maps will be completed by the end of 1989. When published, these maps will represent one of the most comprehensive and detailed regional marine geological and geophysical studies. They will be a very useful source of information for the Member States of the region in the development and management of their marine mineral resources, as well as for scientific communities who are interested in geological and geophysical features of the area in promoting their scientific research.

36 At this stage, neither IOC nor CCOP has the capacity in its Regular Programme budget to meet the costs of such a publication. Under current circumstances, it appears that the only possible approach is to solicit offers from Member States to assume responsibility for publication of the complete set of ten transects, or appropriate subsets, or individual transects.

37 The Guiding Group supported that the Transect Study be completed and that publication of the results in a timely and cost-effective manner be arranged. Taking into account that a co-ordinator has been identified by the SEATAR group to follow-up this project until its completion. The Guiding Group recommended IOC to consider providing financial assistance for co-ordination of the activities.

38 Dr. Kitazawa highlighted the current STAR activities. At the CCOP/SOPAC-IOC Workshop on Coastal Processes in the South Pacific Island Nations, Lae (Papua-New Guinea), 1 - 8 October 1987 (IOC workshop Report No. 51), it was pointed out that active participation in the implementation of the OSNLR Programme would be beneficial to the South Pacific region since the OSNLR's global shallow water sub-programme covers common interests such as, palaeogeographic mapping, the coastal zone as a resource, mapping of palaeo-strand lines, and modification of the coastal environment. The workshop made recommendations concerning the following research topics to the sponsoring organizations: studies of the implication of past, present and future sea-fluctuations; coastal zone inventory and mapping; and detailed studies of coastal and shallow water systems. Considering the urgent need of the region to solve coastal problems, the Workshop requested CCOP(SOPAC) and IOC to seek possible ways and means for early implementation of these recommendations.

39 The Fourth Session of the Joint Working Group on the South Pacific Tectonics and Resources (STAR) was organized in Suva (Fiji) on 14 - 15 October 1988, in conjunction with the Seventeenth Annual Session of the CCOP(SOPAC). The Working Group thanked IOC for the various efforts it has made, in co-operation with CCOP(SOPAC), to develop research activities in the South Pacific region. The Working Group reviewed the current regional activities and noted that five scientific deep-dives in the South Pacific with French, Japanese and USA submersibles are planned during the period of 1988-1989. The Working Group agreed to hold, in conjunction with the Fifth Session of STAR and the Eighteenth Session of CCOP(SOPAC)in October 1989, an international workshop on geology, geophysics and mineral resources in the south Pacific. Similar workshops, organized with joint sponsorship of CCOP(SOPAC) and IOC, were held in 1975 and 1980 to review the progress of marine geological/geophysical studies and to identify common topics for near future international co-operative research. IOC has been invited to participate in the Organizing Committee of the workshop and to co-sponsor it.

40 The Guiding Group welcomed results of the CCOP(SOPAC)-IOC Workshop held in Lae (Papua New-Guinea) and recommended IOC, in co-operation with CCOP(SOPAC), to take adequate action. It also recommended IOC to co-sponsor the proposed workshop in October 1989 on marine geology, geophysics and mineral resources in the south Pacific.

41 The Guiding Group noted with satisfaction that various activities are being carried out through SEATAR and STAR. It also noted that a detailed work plan was prepared by the Regional Group of OSNLR, but it felt that there is an absolute need to co-ordinate these various activities to avoid duplication of research.

42 The Guiding Group recognized the involvement of numerous organizations and the wide range of marine geoscience interests and activities in the region relevant to OSNLR. It recommends that the Secretary IOC seeks to clarify the links between OSNLR, WESTPAC, CCOP and CCOP(SOPAC) and seeks with these, and other organizations, ways of co-ordinating IOC activities, in order to strengthen OSNLR activities in the WESTPAC region.

4.3. CENTRAL EASTERN ATLANTIC (IOCEA)

43 Dr. A. Chidi Ibe, Regional Co-ordinator for IOCEA, introduced the results of an ad hoc meeting of marine geologists in the IOCEA region held in Abidjan (Côte d'Ivoire) 2-5 November 1988, to define major regional projects and to develop a plan of action as a regional component for OSNLR. Discussions on coastal erosion were concentrated on the need to provide a scientific basis for long term and large scale coastal management and protection in the region. A project, entitled Sediment Budget along the West African Coast, was adopted for early implementation. For effective execution, the project was divided into two sub-projects:

(i) Effect of Dams on the Sediment Flux of Rivers Reaching the Coastline;

(ii) Hydrography and Dynamics of the Coastal Zone including the Inner Continental Shelf.

44 The regional group agreed that the first sub-project could be implemented nationally, while the second sub-project would require international co-operation. With respect to the latter sub-project, two joint cruises were proposed. The first, covering the Gulf of Guinea sector, is slated for the last quarter of 1989. In this regard, the offer from Nigeria to provide its Oceanographic Research Vessel, R.V. SARKIM BAKA, was welcomed by the regional group at its ad hoc meeting in Abidjan. The regional co-ordinator would visit countries in the region in March 1989 to prepare this cruise and confirm logistic details.

45 The second cruise would take place later with a ship to be made available by another Member State of the region.

46 The Guiding Group welcomed the attempt by the regional group to initiate co-operative research in the region and congratulated the regional co-ordinator for his efforts to prepare such a concrete proposal. It pointed out that surveys in shallow water areas should be carried out at the same time as training in offshore surveys by research vessels of various Member States in the region and recommended that these results should be incorporated, at a later stage, in a comprehensive analytical text which would provide useful information not only to marine scientists but also to government officials in charge of coastal zone management.

47 The Guiding Group adopted Recommendation OSNLR-III.3 and strongly recommended IOC to seek ways and means to assist the regional co-ordinator in early implementation of the planned cruise.

4.4 SOUTH-WEST ATLANTIC

48 In the absence of Professor Luis Martins, Dr. Claude Latouche provided information on regional activities related to OSNLR based on his mission to Brazil, Uruguay and Argentina, 5-17 October 1987.

49 Substantial progress has been made following the ad hoc OSNLR meeting of regional experts in Porto Alegre, (Brazil) from 7-11 April 1986, where the following projects were defined as regional component for OSNLR:

(i) The Environment and Dynamics of models of Typical Coastal Systems in the S.W. Atlantic;

(ii) The Geology and Recent Palaeogeographic Evolution of the Continental Shelf off Eastern America between 30-40°S.

Details of these projects are given in the Summary Report of the previous Session of the Guiding Group.

50 An exhaustive bibliography for Brazil relevant to regional marine geosciences since 1980 has been prepared. However, it is not known if a similar project has been completed in Uruguay or Argentina. Dr. Martins, as the Regional Co-ordinator, has agreed to publish an information bulletin devoted to OSNLR activities in the region twice a year. An ad hoc OSNLR group meeting in Punta del Este (Uruguay), 3-5 June 1987 (IOC/INF-729), discussed the state of the implementation of the projects and proposed a new project entitled, Paleo-Environments and Sedimentary Environments of the Humid Region of the S. W. Atlantic. This would compare modern and ancient sedimentary environments of the coastal zone and continental shelf. A tentative plan to hold a Symposium on non-living resources in the southwest Atlantic in Brazil or Argentina in 1990 was proposed during the ad hoc meeting.

51 Dr. Latouche informed that there are two major problems associated with the implementation of the above-mentioned projects: (i) the lack of an IOC subsidiary body; (ii) and the absence of radiocarbon dating facilities in the region and the need for training in this technique.

52 The Training Workshop on Phosphorite and Offshore Minerals was held in Porto Alegre (Brazil), from 7 to 11 November 1988 under the co-sponsorship of IOC and IGCP: Project 156 (Phosphorites). Thus, the first co-operative action between these two programmes, eleven geologists have been trained in theoretical and practical aspects of mineral exploration within the Exclusive Economic Zone (EEZ) (see item 5.1).

53 The Guiding Group expressed its disappointment that Dr. Martins was unable to participate in the successive two sessions. It requested both IOC and UN(OALOS) to maintain communication with him and try to seek an appropriate participant from the region for the next session if Dr. Martins will not be available.

54 The Guiding Group noted with appreciation Dr. Martins' effort to complete a bibliography related to the OSNLR Programme in Brazil and recommended similar work be carried out in Argentina and Uruguay. It recommended that IOC and UN(OALOS) seek possible ways and means to publish such valuable information from this region.

4.5 OTHER REGIONS

4.5.1 IOCINDIO

55 Dr. Roonwall reported that at its First Session (Islamabad, Pakistan, 3-7 July 1988), the Regional Committee for the Central Indian Ocean (IOCINDIO) decided to adopt two project proposals related to OSNLR Programme. The first one concerns a Geological Survey of the Continental Shelf in the Central Indian Ocean and the second on a study on Riverine Sediment Inputs to the Indus Cone. The Regional Committee felt that the two project proposals required further development. It decided to create a Project Steering Group for each of the two projects based on the two networks of participating institutions/experts.

56 Dr. Roonwall indicated that a wealth of information on manganese nodules were recently released by the Indian Government. He proposed that a conference on mineral resources in the Indian Ocean be organized in 1990/1991.

57 The Guiding Group supported, in principle, the idea to hold a conference and requested Dr. Roonwall to explore the level of interest and support for such a conference and to report back to the IOC Secretariat.

4.5.2 IOCINCWIO

58 At its Second Session (Arusha, Tanzania, 7-11 December 1987), the Regional Committee for the Co-operative Investigations in the North and Central Western Indian Ocean (IOCINCWIO) considered that it was not yet in a position to develop a project within the framework of OSNLR; but would welcome advice from the Guiding Group of Experts for OSNLR. It reaffirmed its interest in the preparation of an International Bathymetric Chart of the Western Indian Ocean (IBCWIO) with the support of Federal Republic of Germany and under the guidance of the IOC Editorial Board for IBCWIO. It was recognized that there are no specific projects under IOCINWIO related to OSNLR.

59 The Guiding Group stressed the need to identify appropriate contacts in the region in order to design and implement projects on non-living resources. Dr. Ibe indicated that on the occasion of his future mission to East Africa, he would be willing to try and establish appropriate contacts. The Guiding Group thanked him for his offer and accepted it.

4.5.3 Mediterranean

60 Dr. El Sayed reported various activities underway in the region relevant to non-living resources, although not linked to the OSNLR

Programme. Placer mineral and aggregate potentials exist but these are not exploitable. The coastal zone of the Mediterranean is considered as a major resource and is suffering from anthropogenic inputs and natural hazards (e.g. damming of rivers, natural subsidence and possible future sea level rise). Several national and international programmes and organizations have recognized and implemented programmes to study and protect the coastal zone resources and to provide recommendation to decision makers for better management of the coastal zone (see Section 5.6).

61 He informed that: (i) the Egyptian National Committee of ICSU/SCOPE, at its meeting in December 1988, decided to implement a programme on the implications of sea level rise for the Nile Delta region; and (ii) the meeting recommended that a task team be established to investigate information availability, the socio-economic implications of relative sea level rise, overcome gaps in previous palaeogeological and geographic studies, and assess groundwater and its management.

62 Programmes designed to monitor different pollutants in the Mediterranean are implemented by UNEP/MAP in co-operation with other Agencies (FAO, WHO, IAEA, IOC). Such studies will help protect the coastal zone as a resource. With regards to the problem of rising sea level and its implication to Deltas, UNEP has appointed specialists to review the status of five selected areas (the deltas of the Rhone, Po, Venice, Tunis and the Nile). Moreover, a bibliography on the coastal zone and climatic impact was published by UNEP in 1988.

63 As a general conclusion regarding the implementation of the OSNLR Programme at a regional level, the Guiding Group recognized that regions of the Pacific, Atlantic and Caribbean are actively engaged in the OSNLR Programme; however other regions with valuable resources such as the Indian Ocean, Mediterranean and the Red Sea are not yet covered by any of the ONSLR Programmes. The Guiding Group recommended IOC to seek possibilities of establishing OSNLR subsidiary bodies in the aforementioned uncovered regions.

64 The Guiding Group requested IOC Secretariat to approach the regional bodies in the Mediterranean and Red Sea such as ICSEM (see Section 5.6) and PERSGA/ALECSO for co-operation in developing OSNLR projects for the respective regions and formation of joint working groups.

5. CO-OPERATION WITH RELATED PROGRAMMES AND ORGANIZATIONS

5.1 International Geological Correlation Programme (IGCP)

65 Dr. V. Sibrava reviewed the structure of the Programme in general, and informed that twelve new projects were approved at the Seventeenth Session of the IGCP Board (Paris, 30 January - 3 February 1989). The following are of particular interest to the OSNLR Programme :

66 Project 156: "Phosphorites" A jointly sponsored IOC-IGCP Training Course on Phosphorites and Offshore Minerals took place in Porto Alegre, (Brazil), (7 - 11 November 1988) (see Section 4.4). This project was successfully terminated in December 1988.

67 Project 274: "Quaternary Coastal Evolution: Case Studies, Models and Regional Patterns". At the invitation of the Project Leader, Dr. O. van de Plache, Dr. C. Latouche represented IOC at the Inaugural Meeting of the Project, (Amsterdam, 19 - 24 September 1988), and presented the OSNLR Programme and suggested possible ways of co-operation with the IGCP Project. Objectives and structure of the Project were defined at the meeting. Within the framework of co-operation between the Project and various related programmes, the representative from IOC was elected as ex-officio Member of the Executive Board of the Project. The next meeting will be held in Malaysia, 4-8 September 1989.

68 Project 296: "Stratigraphic Correlation of the Quaternary in the Asia-Pacific Region". Primary objectives of the Projects are to establish (i) a regional network of Quaternary geoscientists interested in stratigraphic correlation and Quaternary geology for human survival; (ii) a chronological basis for a firm time stratigraphic classification of the Quaternary in Asia/Pacific. As the final result, the Project expects to publish an Atlas of Quaternary Stratigraphy in Asia/Pacific. Most of the geological surveys in southeast Asia are expected to participate in the Project and Mr. J. Rao, Natural Resources Division, ESCAP, will take the leadership at the initiation stage.

69 In conclusion, Dr. Sibrava thanked IOC for its co-operation with the Phosphorite Project, particularly co-sponsoring the training course held in Porto Alegre (Brazil), which led to the successful completion of the Project.

70 The Guiding Group recognized that Project 274 is the one relevant to the OSNLR Programme and recommended that IOC co-sponsor it.

71 The Guiding Group noted that various efforts were made by Geological Surveys in the southeast Asian countries in Quaternary geological research and that ESCAP played an important role in harmonizing them. The Guiding Group pointed out that there are large amounts of non-utilized data obtained through CCOP-IOC sponsored project on tectonics and resources (SEATAR). . It strongly recommended that in order to avoid duplicating efforts in survey the Project 296 should consider to fully use such available data.

72 The Assistant Secretary IOC reported about the suggestion made by the IGCP Board at its current Session (Paris, 30 January - 3 February 1989) that there would be topics of interest for both IGCP and IOC in a possible ocean bed correlation project and there would be other interesting topics for co-operative research in the framework of the Global Change Project of IGBP. In general, the Board welcomed moves to establish an even closer co-operation with IOC than at present and requested the Secretary IGCP to continue to exchange views with the Secretary IOC on ways and means to broaden the co-operation.

73 Dr. Sibrava informed that the Guiding Group could prepare IGCP project proposals, but stated that co-operative IOC-IGCP projects would be more appropriate.

74 The Guiding Group welcomed increasing opportunities for closer co-operation with IGCP Projects and recommended the Secretary IOC to continue to exchange relevant information with the IGCP Secretary.

5.2 QUATERNARY GEOSCIENCE FOR HUMAN SURVIVAL PROJECT

75 Dr. Sibrava outlined the proposal for the new Unesco sub-programme on Quaternary Geoscience for Human Survival, which will be targeted on the southeast Asian area and study various geological aspects related to the human environment in the region. His office proposes the following topics; Volcanic Hazards in the Philippines; Geological Hazards e.g., landslides, earthquakes, floods; coastal erosion.

76 Although a meeting of experts to initiate the project was organized in Bangkok (Thailand) in November 1988, at which IOC was represented by Dr. Cook, the participants could not reach concrete project objectives.

77 The Guiding Group recognized that some topics proposed by Dr. Sibrava were obviously out of the OSNLR scope, particularly those relevant to urban geology. However, the Guiding Group noted that those dealing with the coastal zone in the planned sub-programme were relevant to the OSNLR Programme and co-operative projects could be developed . It requested IOC Secretariat to clarify with Dr. Sibrava the objectives of Unesco sub-programme on Quaternary Geology for Human Survival and inform the Guiding Group accordingly. The Guiding Group recommended IOC to collaborate with appropriate groups in Unesco and develop a project relevant to the OSNLR Programme.

5.3 OCEAN DRILLING PROJECT (ODP)

78 Since the Joint Oceanographic Institutions Inc. (JOI), which is a consortium of ten major US oceanographic institutions and serves as the prime contractor with NSF for operation of the Project, was unable to send its representative to the Session, Dr. Latouche, referring to the Summary Report of the previous Session of the Guiding Group, reviewed the relation with the OSNLR Programme and ODP. ODP contacted IOC seeking advice on how they could facilitate better involvement of scientists from developing countries in the Project. Following the recommendation of the previous Session of the Guiding Group, the Chairman of the Guiding Group wrote to the Chairman of JOIDES Executive Committee, so far no further correspondence has been received.

79 After reviewing various possibilities for involvement, the Guiding Group recognized that most of the developing countries are facing lack of manpower, facilities and financial resources to establish a marine geoscience infra-structure to involve in ODP research activities.

80 The Guiding Group recommended that IOC consider to approach the ODP member-countries and seek possibilities of receiving assistance in the incorporation of scientists from developing countries into ODP activities. This request should refer specifically to their participation in (i) ODP-related studies, such as site survey for drilling, with conventional research vessels as well as shore-based follow-up studies; and (ii) studies onboard the Drilling Vessel JOIDES RESOLUTION, and shore-based studies following drilling cruises, or both.

81 The Guiding Group further recommended IOC to assist scientists from developing countries to participate in ODP-related post-cruise meetings, workshops and conferences.

5.4. INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS (ICSU) and COMMISSION FOR MARINE GEOLOGY OF INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS/CMG)

5.4.1 International Geosphere-Biosphere Programme (IGBP)

82 Professor Dr. H. Hsu, Chairman of the Commission for Marine Geology (IUGS), reported on this subject. He explained that the Commission for Marine Geology of IUGS (IUGS/CMG) is now deeply involved in the Global Change Programme of IGBP which is ICSU's most recent major programme. The main objective of the Programme is to describe and understand the interactive physical, chemical and biological processes that regulate the total earth system, the unique environment that it provides for life, the changes that are occurring in this system and the manner in which they are affected by human actions.

83 In December 1988, a multidisciplinary conference was held in Hamburg (FRG), which summarized the contributions of solid earth sciences to the understanding of short-term instabilities in the earth system to IGBP. A meeting of IUGS Task Group on Global Changes (IUGS/TGGC), was convened under the leadership of Professor Hsu in Samedan (Switzerland), 21-22 April 1988. The group supported the goals and objectives proposed by ICSU, and in particular highlighted that Global Change Studies should not only cover climatic changes but also other global changes in geosphere and biosphere. It pointed out that an understanding could be facilitated by a study of the record of past global changes. It recommended that IUGS initiate a programme to study these past global changes and identified the following four major themes: Past Global Changes in the Marine Record; Past Global Changes in the Terrestrial Record; Anthropogenically induced Global Changes; and Interaction of Organisms and Palaeo-environments. The group submitted a proposal for the organization of a co-operative International Workshop on the Record of Past Global Changes. The Workshop would have two complementary objectives:

(i) to provide a comprehensive overview of the present state of knowledge of the record of past global change;

(ii) to provide a preliminary planning document for an international interdisciplinary project on the development of a quantitative outline of the record of past global change in a format suitable for integration with the IGBP studies of contemporary and future global change.

84 The Workshop would comprise four working groups: ocean and atmosphere, continents, anthropogenic changes, genetic diversity. It will take place in Interlaken (Switzerland), 24 - 28 April 1989. Among different organizations, IOC could be co-sponsor of the meeting with IUGS.

85 The Guiding Group welcomed the report presented by Professor Hsu and noted the relevance of the proposed programme and workshop to the OSNLR Programme, particularly regarding the coastal zone component and coastal erosion. It recommended that IOC explore the possibility of participating in the organization of the Workshop at Interlaken (Switzerland).

5.4.2 Commission for Marine Geology (CMG)

86 Professor Hsu reported on the recent accomplishments of the Commission, particularly regarding co-operative activities related to IOC.

87 IUGS/CMG, in collaboration with IOC, Unesco and SCOR, organized an International Workshop on Marine Geosciences in Heidelberg (Federal Republic of Germany), 19 - 23 July 1982. The Workshop was focused on the marine non-living resources. In the course of the past five years a number of important meetings have been organized or influenced by CMG, with major efforts directed towards the preparation of Arctic deep sea drilling. Indeed the Arctic Ocean regions play a key role in understanding processes leading to the glacial regimes.

88 As previously explained, CMG is now deeply involved in the Global Change Programme of IGBP. The Chairman of CMG was appointed as Chairman of IUGS Task Group on Global Change (IUGS/TGGC), to co-ordinate the efforts and contributions of the geologic sciences to global change.

89 The work plan of CMG for the coming years includes an important workshop (for the second half of 1989), devoted to the marine geosciences of the shelf and interior seas. CMG considers that after the last International Workshop on Marine Geosciences in Heidelberg (1982), it would be timely to give attention to the shallow water areas adjacent to the continents in particular to the problems of coastal erosion, pollution, waste disposal.

90 The Guiding Group expressed its appreciations for the report of Professor Hsu. It recommended that IOC and UN(OALOS) continue to encourage and assist co-operative activities with CMG in study related to marine non-living resources.

5.5 COMISION PERMANENTE DEL PACIFICO SUR (CPPS)

91 Mr. Hugo Llanos, the representative of CPPS, expressed on behalf of the Secretary CPPS, the interest of CPPS in establishing an OSNLR-related project in the Eastern Pacific. CPPS is an intergovernmental organization comprised of Colombia, Chile, Ecuador and Peru and the Commission's Headquarters is now situated in Bogota (Colombia). Although Panama is not a Member Country at this stage, it participates as a full member of the UNEP-CPPS Regional Seas Action Plan for the protection of the southeast Pacific against all sources of pollution. Within the framework of the Regional Action Plan, CPPS will convene a meeting of experts for co-operation on ocean mining and Uses of the Sea, in Quito (Ecuador), 14-16 June 1989. At the meeting, discussions will be held through ad hoc sessional groups on: (i) scientific research; (ii) technology; (iii) pollution prevention and environmental monitoring; (iv) sea-use planning; and (v) legal affairs. It is expected that a representative from IOC will attend the meeting and co-ordinate the work of the Scientific Research Group.

92 The representative of CPPS informed the Guiding Group that initial steps have been taken to establish a regional group of experts for the OSNLR Programme and requested IOC and UN(OALOS) to provide possible assistance to initiate the group's activities.

93 The Guiding Group welcomed action taken by CPPS to create a regional group of experts relevant to the OSNLR Programme and recommended IOC and UN(OALOS) to consider sending experts to the planned meeting on Co-operation on Ocean Mining and Uses of the Sea.

5.6 INTERNATIONAL COMMISSION FOR THE SCIENTIFIC EXPLORATION OF THE MEDITERRANEAN SEA (ICSEM)

94 At the request of Dr. Doumenge, Secretary ICSEM, Dr. Latouche represented the Commission and introduced current activities of ICSEM related to the OSNLR Programme. He provided an overview of co-operative research developed in the Mediterranean Region within the framework of ECOMARGE and EURECOMARGE. ECOMARGE is an interdisciplinary French programme, including biology, chemistry, geology and physical oceanography, devoted to the study of the behaviour of fluvial fluxes, both dissolved and suspended matters, on the continental shelves from the coastal environment to the deep sea. Research is carried out on the French Mediterranean Margin, mainly Golf of Lions and Rhone delta, and on the Atlantic Ocean off the Gironde Estuary, in order to compare conditions of two different coastal systems: the Mediterranean Margin which is narrow and without tides; and the Atlantic system which is a very wide and dynamical margin due to important tide and currents. This French programme sponsored by Centre National de la Recherche Scientifique (CNRS) is associated with a European Programme called EURECOMARGE, sponsored by European communities and ICSEM. In the framework of ICSEM various countries participate in this research programme, e.g., Spain, Italy, Greece, France, Algeria. Co-operative research, through various projects and cruises relevant to the objectives of ECOMARGE, are carried out on the continental shelves of the participating countries.

95 Dr. Latouche participated, as the representative of IOC, in the

Thirty-First Meeting of ICSEM in Athens (Greece), 18-22 October 1988, at which he explored the possibilities of implementing co-operative programmes with ICSEM relevant to OSNLR. Activities of ICSEM were discussed during several working group sessions. Among these, the following are directly involved in marine geosciences and could be considered as relevant subjects to the OSNLR Programme: lagoons, marine geology and geophysics, marine pollution, insular environments, marine radioactivity, ecosystems of the continental margins and deep-sea drilling in the Mediterranean Sea.

96 Recognizing that no OSNLR regional group exists in the Mediterranean, The Guiding Group recommended that IOC consider establishing an OSNLR regional group of experts, or a joint working group for the Mediterranean, in consultation with existing appropriate bodies in the region (e.g., ICSEM, SCOPE and UNEP), bearing in mind that some of their activities are similar to OSNLR components (e.g., CZAR and SETR). The main tasks would be to promote OSNLR activities in the region, to compile bibliographies related to the OSNLR Programme, to identify gaps in research capabilities and needs, and to assess exploitable non-living resources

5.7 DIVISION OF MARINE SCIENCES, UNESCO

97 In the absence of a representative from the Division of Marine Sciences, Dr. Ibe reported current progress related to COMARAF.

98 In July 1987, the COMAR Programme was expanded to include a regional project on coastal marine systems in Africa (COMARAF). COMARAF proposed the implementation of several pilot projects: (i) Productivity of Coastal Systems, Estuary, Mangroves and Lagoon Ecosystems of West and Central Africa; (ii) Productivity of Coral Reef Ecosystems from Mauritius and East African Region; and (iii) Coastal Erosion and Hydrology in West and Central Africa.

99 At this stage, the development of COMARAF mostly includes the organization of the following workshops and training courses: Training Course on Productivity in African Coastal Waters, Douala (Cameroon), 14-22 December 1987; Workshop on Fundamental and Applied Marine Ecology, Mombasa Kenya, 14-18 April 1988; Syntheses on Lagoon and Marine Ecosystems of Ivory Coast, 16-21 May 1988; Unesco-IOC Training Course on Physical Oceanography, Conakry (Guinea), 15-22 December 1988.

100 The Guiding Group regretted that a representative of the Division of Marine Sciences could not participate in the Session. It strongly requested IOC to maintain a good exchange of information with the Division on non-living resources related activities and requested also to be kept informed on future activities of COMAR, particularly on COMARAF.

6. AVAILABLE NEW TECHNOLOGY AND TECHNIQUES

101 At the previous Session, the Guiding Group proposed that a special session be held related to the scientific progress which could be obtained from application of new available technology through the presentation of papers. Following this proposal, a half-day session was organized with the

support of the Comite d'Expansion Aquitaine, with the following invited speakers:

A. WADSWORTH	:	Satellite Imagery - Radar and Spot Image
J. AVOINE	:	Field Measurements and Modelling of Sediment Transport in Coastal Environment
B. LONG	:	Offshore Station for the Monitoring of the Sea floor
B. O'CONNOR	:	The Use of "REMOTS" (Remote Environmental Monitoring of the Sea Floor)
T. SANKEY	:	OSNLR Data and the IODE System
G. HENAFF	:	Real Time Dredging System

102 The Guiding Group expressed its appreciation to the speakers for the presentations and thanked the Comité d'Expansion Aquitaine for making this special session possible.

7. TRAINING

103 The Technical Secretary for the Session informed about training activities currently carried out by IOC.

104 In this intersessional period, three training courses and two regional workshops relevant to OSNLR were organized : (i) Training Course on Bathymetric Charting in the Western Indian Ocean, Antananarivo (Madagascar) and on board R.V. METEOR, 10 June - 2 July 1987, with financial support by Federal Republic of Germany and with the technical assistance of the German Hydrographic Institute. It consisted of one week onshore training and two weeks onboard training; (ii) CCOP/SOPAC-IOC Workshop on Coastal Processes in the South Pacific Island Nations, Lae (Papua New Guinea), 1-8 October 1987; (iii) Training Course on the Understanding and Management of the Coastal Zone of the Caribbean Region was convened in Cartagena (Colombia), 18 May-3 June 1989, by the University of Bordeaux I with financial assistance of France (see Section 4.10); (iv) WESTPAC Workshop on Margin of Active Plates, Shanghai (China), 7-10 September 1988 and (v) Training Workshop on Phosphorites and Offshore Minerals was organized with the technical collaboration of a group of experts from IGCP Project 156, in Porto Alegre (Brazil), 7-11 November 1988 (see Section 5.1).

105 The Technical Secretary informed that in total twenty-one scientists have participated in eleven cruises for shipboard training during the period of 1987/88. Berths were made available on research vessels of Japan, UK, FRG, and USSR and, in addition, the Japanese Government offered financial assistance to enable scientists to join the cruises.

106 The Technical Secretary also informed that an advance training course on Continental Shelf Structure, Sediments and Resources is in the planning stage with the assistance of the Federal Republic of Germany. The course is designated to respond to the urgent needs of the developing countries in southeast Asia to learn more about the non-living resources potential of their continental shelves, with particular attention to the coastal zones. The aim of the course will be to give advanced training to

scientists from the region on bathymetric (morphological) charting, seismic profiling, sediment distribution, placer deposits and related oceanographic survey techniques, including current measurements and sediment sampling. During the course, a geological field trip on board the research vessel will be organized for demonstration of marine geology/geophysics research.

107 The Guiding Group welcomed the outline of the course, particularly the idea of a demonstration of a sea-going survey and geological sampling on board the research vessel and of practical training on analysis of multi-channel seismic records. It strossed that, in future courses, items related to practical training should be strengthened.

108 The Representative of the UN(OALOS) described the training activities of his office. Due to staff and other resource constraints, training activities in the recent past have been limited to making contributions to courses prepared by organizations outside the UN, or governments, in the field of near-shore mineral resource assessment and sea-use planning and management. The training courses on Near Shore Minerals Assessment organized by the Government of Canada in Halifax and by CCOP/SOPAC in Suva (Fiji) were funded by ICOD; UN(OALOS) participated in WMO Programme on Marine Affairs at the Maritime University in Malmö (Sweden); International Ocean Institute (IOI) courses; and lectures at the University of Rhode Island in connection with its Marine Affairs and Law of the Sea Programmes. While this level of activity will continue, his office looked forward to organizing, on a modest scale, in its own training programme, using extra-budgetary funding and utilizing expertise input from organizations outside the UN system.

109 The Guiding Group noted that various training activities carried out by both sponsoring Agencies and requested them to seek more training opportunities, particularly facilitating participation in research cruises and their post-cruise research activities.

110 Dr. Boris Lopatin informed that an international training course tentatively entitled: International High Grade Course on Geological and Geophysical Methods of Sea-Bottom Investigations, is planned to be held in USSR in 1990. The course aims at training marine geologists from developing countries, who already have some basic knowledge and practice on offshore geology in interpretation of geological and geophysical data (from seismic, side scan sonar, magnetics, bottom sampling, geochemistry, satellite imageries, bottom photography, etc.), and in compilation of geological, palaeogeographic, geomorphologic maps, of litho-facies and mineral deposits.

111 The Guiding Group noted with appreciation the development initiated by USSR authorities, and requested Dr. Lopatin to provide detailed information to IOC and UN(OALOS) to enable consideration of the level of assistance. It recommended that the IOC and the UN (OALOS) consider assisting the organization of the courses when the appropriate information is provided.

8. PLAN OF ACTION FOR IMPLEMENTATION OF OSNLR ACTIVITIES

112 The Secretary IOC, Dr. Gunnar Kullenberg, recalled the various sources of funding available for the IOC programmes and underlined that the role of the Guiding Group is to identify specific projects judged as highly relevant to the OSNLR Programme. These projects could correspond to a limited number of topics such as: (i) coastal management, including CZAR and coastal zone erosion in relation to the effects of damming, natural hazards and storms, exploitation of sand and gravel, ground water; (ii) mineral resources in shallow water such as placers, building material (sands, gravel, carbonates), phosphorite, siliceous oozes, glauconitic deposits; and (iii) manganese nodules and crusts, metalliferous sediments and sulphides.

113 He stated that in order to initiate level research projects at a regional level, IOC could consider to provide financial assistance and to appoint co-ordinators in each region to stimulate and monitor the implementation of these projects. These co-ordinators would also be responsible to guide related research activities and to report the progress of the implementation to the Guiding Group in their capacity as ex officio members.

114 The Secretary IOC then expressed the need to receive project proposals, on a regional and global level, with a clear indication of objectives and expected results, institutional framework, as well as a project budget. He also requested that these proposals should be accompanied with a detailed plan of action for four/five years. IOC would consider, in responding to them, to support project implementation in sharing management cost, e.g., communication, organizing meetings/workshops, travel to attend cruises/training courses. Nevertheless, the main research grants for the projects should be borne by obtaining research support from participating countries and extra-budgetary funding.

115 The Guiding Group summarized, after exchange of various views, that the following points should be included in requested project proposals: project objectives, expected results, subject area, planned sampling and research cruises, as well as coastal surveys, research plans, available resources and facilities, necessary training components, possibilities of mutual assistance, planned meetings and budget.

8.1 IMPLEMENTATION AT REGIONAL LEVEL

116 Ad hoc sessional study groups were convened to examine, in depth, the submitted proposals and workplans by regional groups and to formulate project proposals for early initiation of regional research.

117 The ad hoc study group for the IOCEA region recognized that the regional group of experts had identified a common research project on Sediment Budget along the West African Coastline and is in the process of organizing a joint research cruise late in 1989. It proposed that priority should be given to this project.

118 The ad hoc study group for the WESTPAC region studied ten projects proposed by the regional group. In conclusion, it proposed to the Guiding Group that projects on Late Quaternary Palaeographic Maps in the WESTPAC region and on Boundary Processes along the Margin of Plates are the most relevant to be considered as potential regional projects for immediate implementation.

119 The ad hoc study group for the IOCARIBE region concluded that three research themes identified by the regional group (see Section 4.1) need to be examined carefully, particularly on the basis of available human resources and facilities and requested the regional group of experts to formulate the projects with a practical workplan.

120 Based upon reviews carried out by the sessional study groups, the Guiding Group concluded that at this stage the following regional projects should be given priority for implementation and appointed project leaders:

(i) Late Quaternary Palaeogeographic Maps of the WESTPAC Region (Professor P. Wang, with the assistance of Dr. M. Bradshaw, Bureau of Mineral Resources, Australia);

(ii) Boundary Processes along the Margin of Plates (Professor H. Kagami);

(iii) Sediment Budget along the West African Coastline (Dr. A. Chidi Ibe).

121 The Guiding Group reaffirmed its endorsement of Recommendations: OSNLR-III.1, III.2 and III.3 and the above project proposals, and strongly recommended that IOC mobilize funds to assist in the funding to initiate the projects.

122 Regarding the project proposal concerning IOCARIBE, the Guiding Group recognized that the project required further development. Nevertheless, it supported the outline of the project, but called on the Regional Co-ordinator to focus the proposal on some limited pilot areas and to submit a work plan for adoption at the next IOCARIBE Session.

8.2 IMPLEMENTATION AT THE GLOBAL LEVEL

123 Concerning the global scale projects, a project proposal on Continental Margin Stratabound Authigenic/Diagenetic Sediments was proposed for extensive research on phosphorite deposits. The project aims at gathering information on the composition and spatial distribution of phosphorite concretions (nodules, crusts and impregnations) in areas which are most likely to contain them. Such areas should be selected taking into account the economic needs of a region, as well as the need for having the necessary geoscientific infrastructure of the coastal state(s) available where the offshore work will be undertaken. Moreover, the areas selected should be reasonably well known geologically, i.e., pertinent information should be available e.g., the neogene to recent sedimentation pattern of the area and information on the paleo-oceanographic, paleo-geographic and paleo-climatic evolution of the region.

124 Considering the economical importance of phosphorites and successful completion of the phosphorite research project, the Guiding Group endorsed the Recommendation: OSNLR-III.4 and requested Dr. H. Beiersdorf to help facilitate the initiation of the project and monitor its development.

125 It was pointed out that information on worldwide exploration and mining activities is diverse and difficult to obtain. While some resides in the scientific literature, much is in limited circulation (i.e., trade journals, company reports or internal government files), collection of existing knowledge, and of interpretation on ongoing and proposed activities would facilitate the preparation of appropriate regional programmes, both within OSNLR and for other uses. The information would be of value to resource managers and other users of the ocean space within the region. When used in conjunction with regional resource assessments, it would provide valuable support for specific project proposals. Such a synthesis would help direct resource geologists in many regions to relevant information on deposit characteristics, exploration strategies and mining approaches.

126 The Guiding Group urged that the compilation of available information is valuable and relevant to carry out under the OSNLR Programme and requested Dr. P. Hale, in close co-operation with UN(OALOS) and IOC Secretariat, to draft a plan of action for the intersessional period and report to the Chairman OSNLR on the progress. It recommended UN(OALOS) and IOC to assist the initiation of this activity.

127 The Guiding Group recognized that geological mapping is an important means in obtaining sufficient systematic data on geology, distribution of mineral resources and environmental conditions, especially in near-shore areas. The set of maps would present a comprehensive and reliable base for multidisciplinary uses and research, including with aspect to sea level changes, geological and coastal zone dynamics, tectonic evolution, environmental baseline studies, inventory of placers, sands, gravel, carbonates, phosphorites, hydrocarbons and other non-living resources. The maps could include the sea bottom, geology surface sediments facies, & geomorphology, tectonics, isopachs of recent and quaternary sediments, and map of mineral deposits.

9. ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR THE INTERSESSIONAL PERIOD

128 In accordance with the termination of the services of the Chairman and Vice-Chairman at the end of the current session, nominations from the Guiding Group were requested for candidates for the Chairman and Vice-Chairman for the intersessional period. Dr. Chidi Ibe thanked the current Chairman and Vice-Chairman for their efforts to promote the OSNLR Programme and proposed that Professor Michel Vigneaux continue as Chairman and Dr. Peter Cook as Vice-Chairman. The proposal was seconded by all participants. Therefore, the Guiding Group unanimously re-elected Professor Vigneaux and Dr. Peter Cook for the intersessional period.

10. DATES AND PLACE OF THE NEXT SESSION

129 The Guiding Group recommended that it meet again in approximately two years. Possible places for the next session were UN Headquarters in New York, or Unesco Headquarters in Paris. The dates and place will be decided by OSNLR Officers and the Secretariat of the sponsoring organizations.

11. ADOPTION OF THE SUMMARY REPORT

130 The Guiding Group adopted the Summary Report and Recommendations.

12. CLOSURE

131 In closing the session the Chairman thanked the participants for their valuable contributions which made the session lively and profitable. He also thanked the Guiding Group for their work in formulating possible research projects and stressed the importance to initiate actions in implementing them. The Chairman assured the Guiding Group that he and the Vice-Chairman will do their utmost to develop the OSNLR Programme and to assist implementation of potential projects endorsed at this session.

132 The Chairman expressed thanks, on behalf of the participants, to the Comité d'Expansion Aquitaine for its assistance in local organization, and to the Secretary IOC and his staff for the arrangements of the meeting and for their assistance in carrying out the intersessional activities. He also expressed his appreciation to UN(OALOS) for their active participation in the OSNLR Programme.

133 The Session was closed at 1200 hours on Saturday, 25 February 1989.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATIVE ARRANGEMENTS

   2.1 ADOPTION OF THE AGENDA
   2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION
   2.3 CONDUCT OF THE SESSION

3. OVERVIEW OF INTERSESSIONAL ACTIVITIES

4. IMPLEMENTATION AT THE REGIONAL LEVEL DURING THE INTERSESSIONAL PERIOD

   4.1 CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)
   4.2 WESTERN PACIFIC (WESTPAC)
   4.3 CENTRAL EASTERN ATLANTIC (IOCEA)
   4.4 SOUTHWEST ATLANTIC
   4.5 OTHER REGIONS

      4.5.1 Central Indian Ocean (IOCINDIO)
      4.5.2 North and Central Indian Ocean (IOCINCWIO)
      4.5.3 Mediterranean

5. CO-OPERATION WITH RELATED PROGRAMMES AND ORGANIZATIONS

   5.1 INTERNATIONAL GEOLOGICAL CORRELATION PROGRAMME (IGCP)
   5.2 QUATERNARY GEOSCIENCE FOR HUMAN SURVIVAL PROJECT
   5.3 OCEAN DRILLING PROJECT (ODP)
   5.4 INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS (ICSU) AND COMMISSION FOR MARINE GEOLOGY OF INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS/CMG)

      5.4.1 International Geosphere-Biosphere Programme (IGBP)
      5.4.2 Commission for Marine Geology

   5.5 COMISION PERMANENTE DEL PACIFICO SUR (CPPS)
   5.6 INTERNATIONAL COMMISSION FOR THE SCIENTIFIC EXPLORATION OF THE MEDITERRANEAN (ICSEM)
   5.7 DIVISION OF MARINE SCIENCES, UNESCO

6. AVAILABLE NEW TECHNOLOGY AND TECHNIQUES

7. TRAINING

8. PLAN OF ACTION FOR THE IMPLEMENTATION OF OSNLR

   8.1 IMPLEMENTATION AT REGIONAL LEVEL
   8.2 IMPLEMENTATION AT GLOBAL LEVEL

9. ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR THE INTERSESSIONAL PERIOD

10. DATES AND PLACE OF THE NEXT SESSION

11. ADOPTION OF THE SUMMARY REPORT

12. CLOSURE

ANNEX II

RECOMMENDATIONS

RECOMMENDATION OSNLR-III.1

LATE QUATERNARY PALAEOGEOGRAPHIC MAPS OF THE WESTPAC REGION

The Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR):

Noting the successful conclusion of the workshop on Marine Geology in the WESTPAC region, held in Shanghai (China), 7-11 September 1988,

Noting further with satisfaction the fully documented regional research proposals developed at the Workshop,

Recognizing the importance of palaeogeographic map of high and low strandlines on the Quaternary as a basic document for coastal zone management and its high relevance to the SETR component of OSNLR,

Recommends that IOC consider to provide financial assistance for implementing the project on Late Quaternary Palaeogeographic Maps of the WESTPAC region.

ANNEX TO RECOMMENDATION OSNLR-III.1

Project title:	Late Quaternary Palaeogeographic Maps of the WESTPAC region
Project Objective:	Compile a series of maps of the sea-floor and coastal zone for the WESTPAC region related to (i) present sedimentology and geomorphology; (ii) palaeogeography for 18 KY BP (15-20 KY BP timeslice); and (iii) palaeogeography for 120-125 KY BP (100-140 KY BP timeslice).
Project Outline:	Referring to the SETR sub-project of OSNLR the proposals aims at compiling numerous available palaeogeographic and geophysical data on the coastal zones in the region and mapping coastlines on high and low stand in the Late Quaternary. New techniques of geological sampling and seismic profiling will be applied when necessary. Precise C14 dating will be obtained using shells from sediments already cored or from new samples.

The necessary steps should be taken as follows: (i) review data already collected and identify the gaps; (ii) identify additional needs, e.g., geological samples and survey profiles; and (iii) review and compile data for better final products.

Project Implementation

Under the guidance of the project co-ordinating committee with representatives of the participating countries/institutions

(i) Start with maps of 15-20 KY BP time slice, the lowest stand of last glaciation and of 100-140 KY BP time slice, last interglacial highstand. Lot of data already assembled. The approach should be toward back into less well known section. Important results for climatic change, environmental geology and understanding of high and low stands are important in the past for mineral occurrence.

(ii) Technical meetings to select legends, scale and format for stratigraphic scale will be recommended to be held as a part of a mini-symposium in 1989-90. A mid-term workshop will follow in 1990-91. A training workshop is strongly supported to be held in 1991. Final symposium will be recommended to be held in 1992 or 1993.

Budget:

Co-ordination meeting (5)	US$30,000
Technical meetings (3)	15,000
Reporting cost	5,000
[1]	US$ 50,000

[1]Note: expenses for printing of maps (estimated cost $300,000) are assumed to be sought from external resources.

RECOMMENDATION OSNLR-III.2

BOUNDARY PROCESSES ALONG THE MARGINS OF PLATES

The Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR):

Noting well documented proposals for regional co-operative research which have fairly direct relevance to the aims of the OSNLR Programme,

Recognizing that various kinds of plate boundary processes occur in the WESTPAC region,

Recognizing also the importance in applying the results of plates boundary studies to the assessment of mineral and energy resource potential,

Recommends IOC to assist in the early initiation of a regional co-operative research project on boundary processes of plate margins,

Urges the IOC Member States interested in marine geology in the WESTPAC region to contribute with ship time and berth spaces with their research vessels to this project.

ANNEX TO RECOMMENDATION OSNLR-III.2

Project title: Boundary Processes along the Margin of Plates,

Project Objective: To delineate plate boundary and understand processes occurring along these boundaries as a basis for investigation on tectonic framework and assessment of mineral and energy resources potential;

Project Outline: In the early stage of the project it is important to recognize boundaries of microplates in the WESTPAC region. It is also important to focus on investigation of boundary processes of various kinds of microplates in this area. Studies of boundary processes will clarify the local tectonics of the area more effectively.

Project Implementation:

Phase 1 (1989-91)

In order to identify microplate boundaries in each participating country, available detailed stratigraphic data, and tectonic deformation and various geophysical data should be compiled.

After compilations of existing data and detailed reconnaissance surveys of the key areas of microplates, a mid-term workshop to upgrade the project should be planned in 1990/91.

Phase 2 (1991-93)
Detailed geometric, kinematic and dynamic analysis of tectonic process of microplate boundaries will be the focus of the study.

Compilation of all boundary processes of microplates will be achieved and a better understanding of tectonic controls on the active plate margins will be obtained. A map of microplates in the WESTPAC region will be compiled in collaboration with the paleogeographic map projects.

At the end of this phase, a final symposium is recommended to be held in Tokyo in 1992, in association with the International Geological Congress (IGC). A symposium "Origin and evolution of microplates, back-arc basins and marginal seas" has been already proposed in the marine geology section of IGC and tentatively approved by the organizing committee. Publication of the symposium proceedings will be the outcome of the project.

Budget:

Travel support of participants in cruises (10)	US$20,000
Co-ordination meeting (4)	24,000
Symposium	20,000
Reporting cost	5,000
Total:	US$69.000

RECOMMENDATION OSNLR-III.3

STUDY OF GEOLOGY AND HYDRODYNAMICS OF
NEARSHORE AREA IN THE IOCEA REGION

The Third Session of the IOC-UN/OALOS Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR):

Noting that the research project proposed by the group of experts from the IOCEA region (i) has a highly relevant economic value at the regional and global level; (ii) embodies opportunities for training which attract the highest interest for the region, as well as for the regional component of OSNLR, particularly regarding the component CZAR of the region; and (iii) requires an appropriate infrastructure for successful implementation through regional laboratories or co-operative action,

Recognizing the importance of the proposed plan for a regional oceanographic cruise to study geology and hydrodynamics of nearshore areas in the Bay of Benin in September/October 1989, and the direct relevance of the planned cruise to the objectives of the OSNLR Programme,

Encourages the regional group of experts to implement the planned cruise on schedule,

Recommends that IOC consider to provide the necessary financial and administrative support for the organization of the cruise and to seek possible assistance for post-cruise research in the laboratories of the region.

ANNEX TO RECOMMENDATION OSNLR-III.3

Project title: Oceanographic cruise for the study of the geology and hydrodynamics of the nearshore area and the continental shelf in relation to the problem of coastal erosion in the IOCEA region;

Ultimate Objective: Develop research capabilities of participating countries for the integrated and rational management of the coastal zone and in particular the coastline;

Immediate Targets: Provide training and experience in the observation and measurements of hydrodynamics, tides, waves, currents, winds etc;

Obtain data on physical oceanographic processes, bathymetry and bottom topography, and geology of the continental shelf including geochemistry in selected areas in the region;

Produce a report integrating all data obtained from the cruise and relating them to the problem of coastal erosion in the region and sediment budget along the West African coast.

Implementation Procedure:

Survey Area: Gulf of Guinea and lower part of N.W. Africa up to Dakar: 10m - edge of continental shelf;

Research Vessel: R.V. SARKIM BARKA of the Nigerian Institute for Oceanography;

Participating Countries: Cameroon, Nigeria, Benin, Togo, Ghana, Côte d'Ivoire, Sierra-Leone, Guinea (Conakry) Senegal (also Gabon and Congo)

Duration : 20 days

Number of Participants : 12

Procedures:

1. CRUISE

(i) Positioning at sea
(ii) Bathymetric survey
(iii) Meteorological observations on board
(iv) Observation of sea state
(v) Current measurement
(vi) Bottom photography
(vii) Sea-water sampling for water for suspended sediments analysis
(viii) Sampling with grabbing and coring
(ix) Shallow seismic survey (if available)
(x) Side scan sonar (if available)

2. POST-CRUISE ANALYSIS[2]

(i) Bathymetric map production
(ii) Geophysical data interpretation
(iii) Sedimentological analysis including geochemistry

3. PRE-CRUISE ANALYSIS[2]

Remote sensing : Satellite Imagery

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2 These expenses will be borne, in part, by Member States of the region.

Costing:

1. Pre-Cruise and Cruise[3]	
Preparation of the cruise	US$10.000
Fuel for the Research Vessel	4.000
Participants' travel and per diem during the cruise	2.700
Meals during the cruise	2.500
Cost for co-ordination, including communication cost of the Principal Investigator's Office	1.000
Reporting (issue of the preliminary cruise report)	300
Sub-total:	US$20.500
2. Post Cruise Activities	
Post-cruise research (pre-treatment and distribution of samples and workshop)	US$ 4.000
Workshop	6.000
Report	1.000
Sub-total:	US$11.000
3. General Activities (4 years)	
Travel of scientists in carrying out field/laboratory research	US$10.000
Workshop	20.000
Co-ordination meetings	15.000
Sub-total:	US$45.000
Total (1) + (2) + (3):	US$76.500

[3]Ship-time and salaries of crew will be borne by the Nigerian authorities

RECOMMENDATION OSNLR-III.4

CONTINENTAL MARGIN STRATABOUND AUTHIGENIC/DIAGENETIC SEDIMENTS

The Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR):

Noting the successful completion of the IGCP Project 156: Phosphorites which convened a series of training workshops on regional level over a decade, among them a joint IOC-IGCP Workshop on Phosphorite and Offshore Minerals held in Porto Alegre (Brazil), 7-11 November 1988.

Noting further the economical importance of marine phosphorites as a future source for fertilizer production,

Recognizing the necessity of a research project on marine phosphorites in selected areas aiming to study the composition and spatial distribution of phosphorite concretions (nodules, crusts and impregnations) as well as their economical potential,

Recommends that IOC and UN(OALOS) consider to assisting the key investigators in this field in order to initiate studies on collecting basic data/information on marine phosphorites and to organize a workshop to define the objectives and to draft a project document,

Recommends further that IOC approach the Secretary of IGCP and seek possible ways and means to create a joint sponsored IGCP project.

APPENDIX TO THE RECOMMENDATION: OSNLR-III.4

Project title:	Continental Margin Stratabound Authigenic/Diagenetic Sediments
Principal Objective:	To increase scientific understanding of the mixed authigenic/diagenetic sediments suite and the processes responsible for their formation and accumulation in continental margin environments.
Project Summary:	A research project on phosphorites therefore should aim at gathering information on the composition and spatial distribution of phosphorate concretions (modules, crusts and impregnations) in areas which are most likely to contain them should be selected by emphasizing the economic needs of a region as well as the need for having the necessary geoscientific infra-structure of the coastal state(s) available where the offshore work will be undertaken. Moreover, the areas selected should be reasonably well known geologically, i.e., pertinent information should be available as for example, the Neogene, to recent sedimentation pattern of the area and information on the paleo-oceanographic, paleo-geographic and paleo-climatic evolution of the region (mainly acquired through DSDP/ODP drilling or commercial drill holes).

Implementation Procedure:

1. Initiation

   Two identified principle investigators will (i) collect the existing information on marine phosphorites (e.g., their composition and spatial distribution as well as economic potential) as basic data to design a project; (ii) survey and identify laboratories and institutions in the selected region which could act as key institutions for regional research; (iii) organize a workshop to define the project objectives; and (iv) draft a project proposal.

2. Main Phase (5 years)

   The actual research will be carried out by the participating institutions/individuals in the project. Their research funds should be borne by their national sources or international extra-budgetary funds. A scientific committee of the project will be formulated with selected active scientists to provide guidance to the participating research groups and a co-ordination committee with national representatives for monitoring the level of implementation.

Principal investigators will supervise both project committees and organize training courses/workshops at least once a year.

Budget:

1. Initiation Stage

Travel of principle investigators (2)	US$ 8,000
Workshop	20,000
Reporting	1,000
	US$29,000

2. Main Phase (5 years)

Travel of experts	US$20,000
Committee meeting	30,000
Workshops/Training Courses	25,000
Reporting cost	3,000
Total : US$107.000	78.000

ANNEX III

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ANNEX IV

LIST OF ACRONYMS AND ABBREVIATIONS

ALECSO	Arab Educational, Cultural and Scientific Organization
BP	Before Present
CCOP	Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas
CCOP (SOPAC)	Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CIDA	Canadian International Development Agency
CGMW	Commission for the Geological Map of the World (of IUGS)
CMG	Commission for Marine Geology (of IUGS)
COMAR	Unesco Major Inter-regional Project on Research and Training Leading to the Integrated Management of the Coastal System
CNRS	Centre National de la Recherche Scientifique (France)
CPPS	Comision Permanente del Pacifico Sur
CZAR	Coastal Zone as a Resource
ECOMARGE	Etude de l'Ecologie des Marges Continentales (France)
EEZ	Exclusive Economic Zone
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)
EURECOMARGE	Etude de l'Ecologie des Marges Continentales (European Economic Community)
ICOD	International Centre for Ocean Development (of Canada)
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
ICSEM	International Comision for the Scientific Exploration of the Mediterranean Sea
ICSU	International Council of Scientific Unions
IGCP	International Geological Correlation Programme (of Unesco/IUGS)

INQUA	International Union for Quaternary Research (of IUGS)
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IOCINCWIO	IOC Regional Committee for the Western Indian Ocean
IODE	International Oceanographic Data and Information Exchange (of IOC)
IOI	International Ocean Institute
IUGS	International Union of Geological Sciences
JOI	Joint Oceanographic Institutions, Inc. (of USA)
JOIDES	Joint Oceanographic Institutions for Deep Earth Sampling
MAP	Margins of Active Plates (WESTPAC Project)
MAP	Mediterranean Action Plan (of UNEP)
NSF	National Science Foundation (of USA)
OAU	Organization for African Unity
OCE	Division of Marine Sciences (of Unesco)
ODP	Ocean Drilling Programme
OSLR	Ocean Science in Relation to Living Resources
OSNLR	Ocean Science in Relation to Non-Living Resources
PERSGA	Red Sea and Gulf of Aden Environment Programme
SCOPE	Scientific Committee on Problems of the Environment (of ALECSO)
SEATAR	Joint CCOP-IOC Working Group on Post-IDOE Studies on East Asian Tectonics and Resources
STAR	Joint CCOP(SOPAC)-IOC Working Group on the South Pacific Tectonics and Resources

TGGC	Task Group on Global Change (of IUGS)
TEMA	Training, Education and Mutual Assistance (of IOC)
UN(OALOS)	United Nations, Ocean Affairs and Law of the Sea Branch
UN(OETB)	United Nations, Ocean Economics and Technology Branch
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
Unesco	United Nations Educational, Scientific and Cultural Organization
WESTPAC	IOC Regional Committee for the Western Pacific
WMO	World Meteorological Organization