Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

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

Group of Experts on Recruitment in Tropical Coastal Demersal Communities (TRODERP)

First Session

Cartagena de Indias, Colombia
19-21 May 1987

Unesco

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IOCARIBE/GE-TRODERP-I/3
Paris, 5 January 1988
English and Spanish only

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 Formal 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
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1. OPENING

The First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities (TRODERP) was opened by the Chairman of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Captain Rafael Steer Ruíz, at 9.10 a.m. on 19 May 1987, at the headquarters of the IOC Secretariat for IOCARIBE, Casa del Marqués de Valdehoyos, Cartagena de Indias, Colombia.

The Chairman of IOCARIBE welcomed the scientific co-ordinator of the event, Dr Alejandro Yañez-Arancibia, the foreign and national experts and the representatives of Colombian institutions. Captain Steer briefly explained the role of IOC, its IOCARIBE Sub-Commission and the different groups of experts set up to advise it on the development of its scientific and service programmes. He also stated his Government's willingness to participate vigorously in activities planned for the Caribbean, including those co-ordinated by the Sub-Commission, since it had been honoured by the establishment of the IOCARIBE headquarters in Cartagena.

Dr Alejandro Yañez-Arancibia, scientific co-ordinator of the session, thanked the Colombian Government, on behalf of the participants, for the facilities made available to those taking part in the session. He stressed Colombia's policy of support for scientific activities in the Caribbean and for the Sub-Commission's work in particular.

Dr Fernando Robles, IOC Senior Assistant Secretary for IOCARIBE and Technical Secretary of the Session, welcomed the participants, on behalf of the Secretariat, to the first session to be held at the recently opened IOCARIBE headquarters.

The list of participants is contained in Annex II.

A list of acronyms and abbreviations is contained in Annex III.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

Dr Alejandro Yañez-Arancibia submitted to the session for adoption the provisional agenda (IOCARIBE/GE-OSLR-I/1 prov.), which was adopted without amendments. The agenda as adopted is contained in Annex I.

2.2 ELECTION OF THE CHAIRMAN OF THE GROUP OF EXPERTS AND DESIGNATION OF THE RAPPORTEUR FOR THE SESSION

Dr Daniel Novoa proposed Dr Alejandro Yañez-Arancibia as Chairman of the IOCARIBE Group of Experts on TRODERP for the session and the following intersessional period. The proposal was adopted unanimously. Mr Ricardo Alvarez Léon, M.Sc. was proposed as Rapporteur, and that proposal was also adopted unanimously.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

The Technical Secretary, Dr Fernando Robles, gave details of the administrative arrangements for the session and reviewed the list of working and reference documents (document IOCARIBE/GE-OSLR-I-4 prov.). The documents were distributed with the formal invitations sent to individual experts by the

IOC Secretary, Dr Mario Ruivo, or distributed during registration for the session.

Dr Fernando Robles then gave a brief account of the establishment, development and current status of the OSLR programme, including its main component, the IREP Subprogramme. He drew attention to the main OSLR-supporting resolutions adopted by the IOC governing bodies and recalled that the programme was co-sponsored by FAO. He also reminded participants that the first international workshop on TRODERP had been held in Ciudad del Carmen, Mexico, in April 1986, at the invitation of the Mexican Government (Doc. IOC Workshop Report No. 44). The terms of reference for the future implementation of TRODERP were established at that workshop.

3. CONSIDERATION OF THE RECOMMENDATIONS OF THE WORKSHOP ON RECRUITMENT IN TROPICAL COASTAL DEMERSAL COMMUNITIES AND OTHER OSLR REGIONAL COMPONENTS

3.1 TROPICAL DEMERSAL RECRUITMENT PROJECT (TRODERP)

The Group of Experts considered the recommendations of the IOC/FAO Workshop on TRODERP (Ciudad del Carmen, Campeche, Mexico, 21-25 April 1986; Doc. IOC Workshop Report No. 44), and, in the light of priorities determined by the characteristics of regional demersal resources, by the interests of IOCARIBE Member States and by the level of development and progress achieved in research capacity, decided that the following IOCARIBE/TRODERP subprojects met the chosen criteria:

(i) IOCARIBE Subproject on the Recruitment of Demersal Fish in Estuarine-Deltaic Coastal Systems and on Continental Shelves (FEDERP).

(ii) IOCARIBE Subproject on the Recruitment of Penaeid Prawns (PREP).

(iii) IOCARIBE Subproject on the Recruitment of Demersal Species Associated with Reef and Hard-Bottom Ecosystems (CORDERP).

(i) IOCARIBE Subproject on the Recruitment of Demersal Fish in Estuarine-Deltaic Coastal Systems and on Continental Shelves (FEDERP)

Definition

FEDERP is a TRODERP subproject for IOCARIBE designed to further regional understanding of recruitment in highly diversified tropical coastal demersal fish communities connected with estuarine-deltaic lagoon systems. There is accordingly a need for comprehensive multidisciplinary research on physical, chemical, biological, ecological and anthropogenic processes in focal areas, which should include the theoretical context, field work, comparative analysis of data set against experimental findings and/or bibliographical information, recruitment models and systematic analysis of the structure and function of the ecosystem from swamps (coastal swamps and sea marshes) down to the continental shelf. The terms used to refer to coastal ecosystems are shown in Figure 1, which gives a schematic outline of this ecosystem from low-lying lands and areas drained by rivers down to the continental shelf.

Objectives

The Group of Experts recommended that emphasis be laid on the following problems:

(i) Study of coastal processes, environmental variations in habitat and estuarine-continental shelf ecological interactions that affect recruitment.

(ii) Definition of indicators for ecosystem interpretation and synopsis, and for the study of recruitment in multi-species fishing grounds.

(iii) Affinity and relations of fishes with the ecosystem.

(iv) Determination of fundamental bio-ecological aspects, with emphasis on the resource's trophic relations, dynamics of reproduction, mortality, growth and recruitment.

(v) Description and analysis of the link between primary production, river discharge, quantity and quality of habitats, and recruitment.

(vi) Consideration of human impact on the ecosystem (exploitation of multi-species fishing grounds, habitat deterioration, effect of trawling on the seabed, etc.).

Focal areas and functional groups

For practical reasons, the subproject may initially be implemented for focal areas that will have multiplier effects at the regional level owing to their scientific, social and economic importance, such as:

(i) the Mississippi Delta;

(ii) the Usumacinta Delta/The Terminas Lagoon/The Campeche Sound;

(iii) the Magdalena Delta/The Great Salt Marsh of Santa Marta/Cartagena Bay;

(iv) the Orinoco Delta;

(v) the Delta of the Amazon and associated coastal systems.

The Group of Experts recommended a macro-scale view of the ecosystem and its highly diversified resources. It suggested in-depth studies on functional and structural groups of species that are representative of the community, exploited as fish resources, dominant in the ecosystem and found from the Gulf of Mexico to Northern Brazil. Examples are Sciaenidae, Gerreidae, Lutjanidae, Carangidae, Ariidae, Pomadisyidae (Haemulidae), Bothidae and others.

A draft paper containing fuller details of the content of the FEDERP proposal was distributed to participants in the meeting. The draft was distributed for information only; however, its structure might be followed for the FEDERP proposal and the two other components of TRODERP (PREP and CORDERP) described below.

(ii) IOCARIBE Subproject on the Recruitment of Penaeid Prawns (PREP)

Definition

PREP is a subproject of TRODERP for IOCARIBE involving research on the recruitment of penaeid prawns and the different prawning-harvesting and environmental factors (physical, biological, etc.) affecting this.

The importance of prawn resources in the IOCARIBE region is well known, for they are fished at various operational levels, yielding substantial local profits and producing effects on the social environment. However, knowledge of these resources and of the accompanying demersal fauna is still limited, and this must be urgently corrected since the different prawn harvesting methods are very important to the ecosystem and the pressure of exploitation is growing. In particular, no information is available about the direct effects of prawn harvesting on recruitment or on environmental processes connected with recruitment. As a result, the exploitation of prawn resources and current patterns of management are inadequate and highly risky in terms of the adverse effects that they may have.

Some regional experiments (e.g. Gulf of Mexico, Gulf of Carpentaria) have suggested that environmental factors such as river discharge, rainfall, sediments, coastal vegetation, etc., cause seasonal and interannual fluctuations in the abundance of prawns. However, detailed and quantified explanations of the processes surrounding that connection should be given, in order to clarify causal relationships.

The proposed research project should include a plan or basic programme on the dynamics of penaeid prawns and their relations with various ecosystemic factors in order to arrive at a better understanding of these resources and thus establish a framework for a more rational and sustained management or administration of prawn fisheries.

Objectives

With regard to the prep basic programme, the Group of Experts recommended that prominence be given to the following objectives:

(i) Definition of the environmental cycles of parameters considered relevant to penaeid prawn recruitment. Among those parameters, rainfall, the hydrological cycle of rivers flowing into the estuary, variables, controlling th processes of frontogenesis and other long-term climatic processes were suggested.

(ii) Definition of the life cycles and basic bio-ecological aspects of commercially important penaeid species (dynamics of reproduction, food habits, migration, competition predation, growth, mortality, age structure, recruitment, etc.).

(iii) Establishment of possible links between the cycles of environmental parameters and the life cycles of penaeid prawns, with special emphasis on recruitment and its variations.

(iv) Development of quantitative relations, whenever possible, for purposes of forecasting.

(v) Definition of the present relative size (catches, fishing effort, economic and social benefits) of protected artisanal and industrial prawn fisheries (open sea).

(vi) Determination of effects of fishing systems on prawn populations and recruitment.

(vii) Studies of the effects of trawling and the discharge of by-catch fauna on penaeid prawn recruitment.

(viii) Study of the modification of ocean and coastal bottoms by trawling and its effect on prawn recruitment.

(ix) Establishment of management frameworks for harvesting penaeid prawns as a result of programme achievements.

Focal areas

Examples of focal areas for the implementation of the proposed basic programme are:

(i) Continental shelf of the Gulf of Mexico (United States of America and Mexico).

(ii) Central American Continental Shelf (Honduras, Nicaragua, Costa Rica and Panama).

(iii) Island shelves (Cuba and Trinidad and Tobago, for example).

(iv) South American Continental Shelf (Colombia, Venezuela, Guyana, Suriname, French Guyana and Brazil).

(iii) IOCARIBE Subproject on the Recruitment of Demersal Species Associated with Reefs and Hard-Bottom Ecosystems (CORDERP)

Definition

CORDERP is a subproject of TRODERP for IOCARIBE involving research on the recruitment of demersal species associated with reef and hard-bottom ecosystems. Given the local and intraregional importance of these ecosystems and their comprehensive exploitation, the subproject will permit broad participation by IOCARIBE Member States.

There is marked interest throughout the world in learning about, administering, managing, exploiting, protecting and even taking over these ecosystems. Their capacity as a genetic bank and source of living material for the support of commercially profitable demersal species, and the existing interaction with adjacent systems such as salt meadows and mangroves, suggest the need to give priority to studying the recruitment of demersal species in these ecological systems. This will contribute to optimum management and exploitation of these resources.

Objectives

The Group of Experts recommended that emphasis be laid on the following aspects:

(i) Compilation or completion of the qualitative and quantitative inventory of dermersal species that represent fish resources, including an evaluation of the biomass contribution of each species to the ecosystem.

(ii) Evaluation of environmental variations (physical, chemical and biological) that have an impact on recruitment of molluscs, crustaceans and associated fish. The Group of Experts suggested the inclusion, among other variables, of temperature, currents, bathymetry and local geomorphology, reef area; mapping, tidal factors, seasonal and interannual variability, turbidity, sedimentation, salinity, oxygen, nutrients, and, in general, an analysis of qualitative and quantitative biological and ecological factors that make it possible to study the structure and function of the ecosystem.

(iii) Evaluation of the effects of fishing on these ecosystems, with emphasis on the following aspects: type of fishing method, catch, fishing effort, selectivity and efficiency of fishing methods, exploitation rates, mortality, etc.

Focal areas and species

Given the interest of IOCARIBE Member States in these ecosystems and their prevalence and extension in the region, the Group of Experts recommended as focal areas all those in which the commercial species listed below are fished in one form or another:

Molluscs: Strombidae, Melogenidae

Crustaceans: Palinuridae, Scyllaridae, Xanthidae, Gecarcinidae

Fish: Lutjanidae, Serranidae, Pomadasyidae, (Haemulidae), Carangidae, Gerreidae, Sparidae, and others.

3.2 SECOND WESTERN ATLANTIC TURTLE SYMPOSIUM (WATS-II)

The IOCARIBE Chairman, Captain Rafael Steer-Ruíz, introduced this item on the agenda in his capacity as a member of the Executive Committee of the Second Western Atlantic Turtle Symposium (WATS-II, Mayaguez, Puerto Rico, 12-16 October 1987; Doc. SC-IOCARIBE-II/Inf.5).

Presenting a brief outline of the development of this initiative within the framework of IOCARIBE, Captain Steer-Ruíz stressed that in covering the objectives listed in the annotated provisional agenda of the current meeting (doc. IOCARIBE/GE/OSLR-I/2 prov.), WATS-II was seeking to answer important fundamental questions and thereby to provide adequate knowledge of the six species of turtle to be analysed at the symposium. He also emphasized the economic and social importance of these resources to many IOCARIBE Member States.

After a full discussion of the topic, the Group of Experts reached the following conclusions and made the following recommendations:

(i) The problem of the recruitment of species of turtle has not been singled out internationally as a priority component in the OSLR programme; however, actions conducted and planned for WATS-I and WATS-II are of indisputable scientific, economic and social importance to the IOCARIBE region.

(ii) The relevant information produced at both meetings (IOCARIBE/TRODERP and WATS-II) should be pooled. It would therefore be appropriate to establish formal mechanisms for contact between the two projects by sending observers to the respective meetings of each group.

(iii) Through its IOCARIBE Secretariat, IOC should facilitate this type of contact.

(iv) Continuity is desirable in the activities of WATS and in their links with other IOCARIBE activities relating to the study of living resources. WATS should therefore report on measures or mechanisms to be introduced or recommended by the WATS-II symposium, so that this important regional initiative is followed through.

3.3 PHYTOPLANKTON BLOOM, RED TIDES AND ASSOCIATED MORTALITY OF MARINE ORGANISMS

The Group of Experts recognized that mass mortality of organisms occurring in association with phytoplankton bloom and red tides was a frequent phenomenon, in the intertropical zone and the IOCARIBE region in particular. However, it found that the magnitude of the problem, its negative effects on demersal fishing resources, the main areas in which the phenomenon occurred and its periodicity were unknown in the region. The Group of Experts considered that the subject should be re-examined at the next meeting, using as a frame of reference the lines of action suggested by the Second Session of the IOC-FAO Guiding Group of Experts on OSLR (FAO, Rome, 8-12 June 1987), the International Symposium on Red Tides (Takamatsu City, Japan, 10-16 November 1987) and the IOC Workshop on International Co-operation in the Study of Ocean Blooms and Red Tides to be held immediately afterwards at the same place on 16 and 17 November 1987.

At the same time, the Group of Experts, taking into account IOC Resolution XIV-10, considered that it would be most useful to reactivate the work of the Ad hoc IOCARIBE Steering Committee on the subject, possibly by forming a regional group of experts.

4. STRATEGY FOR THE IMPLEMENTATION OF THE ACTIVITIES PLANNED

The Group of Experts considered that, at the moment, it was impossible to be sure of the level of knowledge about the focal areas and functional groups of species in the FEDERP, PREP and CORDERP subprojects. Nor was it known what were the capacities of national and institutional infrastructures and of the scientific specialists from Member States that might be involved in these projects. This was reflected by the fact that current successes were few and far between, methodologies were probably disparate and any important research that might be carried out in focal areas was not adequately disseminated.

The Group of Experts therefore suggested the following arrangements to implement the subprojects and make them viable:

(i) regional workshop;

(ii) training, methodological implementation and postgraduate courses;

(iii) regional symposium;

(iv) collation of information published in focal areas relating directly to the objectives of the subprojects, ideally through the Secretariat of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE);

The following timetable of approved events may be used for guidance in organizing the development actions.

Events	Suggested dates and venues
Workshop	April 1988, Caracas, Venezuela
Courses (different types)	To be defined
Regional symposium	February 1989, Cartagena, Colombia
Collation of published information	Ongoing, as from May 1987

(i) Regional workshop

The Group of Experts suggested organizing, within IOCARIBE, a TRODERP workshop with three specific components corresponding to FEDERP, PREP and CORDERP objectives, with a view to analysing shared problems, devising working hypotheses for the future and standardizing methodologies. In that regard, the Group of Experts suggested the following questions for consideration at the workshop:

FEDERP:

Do coastal processes in fluvial-deltaic-estuarine systems affect recruitment in the highly diversified demersal resources on the continental shelf?

Do species or functional groups of species have affinities with specific coastal habitats in relation to recruitment?

What is the comparative importance of biological control versus physical control in tropical coastal demersal recruitment? (For example, biological control = competition, predation, etc.; physical control = climatic processes, river discharge, areas of coastal vegetation, etc.).

What impact can the exploitation or non-exploitation of prawn-accompanying fauna have on the ecosystem?

PREP:

Do environmental and climatic variations have equivalent effects on the recruitment of different penaeid species found in the region?

To what extent has recruitment in estuarine-dependent species been a success or a failure, given the impact of human beings in coastal areas?

How and to what extent does predation by fish-accompanying fauna affect the recruitment of penaeids?

How and to what extent does prawn harvesting affect the recruitment and abundance of crabs, crayfish and other invertebrates caught unintentionally?

CORDERP:

What effect do trawling and by-catch, including unconventional and illegal fishing methods, have on recruitment in reefs and hard-bottom ecosystems?

Which demersal fish resources depend on reefs and hard bottoms for successful recruitment?

Do the physical mechanisms of microscale water circulation play a determining role in the dispersal of larvae and recruitment in reef and hard-bottom resources?

Do reefs and hard bottoms in the IOCARIBE region represent focal areas of demersal resources that will lend themselves to exploitation?

The TRODERP workshop is the main event in launching the three subprojects, since it should set in train a model programme, extended in space and time, of activities relating to research, retrieval of field information, handling of data and preparation of reports and documents issued under the project.

(ii) Training, methodological implementation and postgraduate courses

This aspect of the development strategy is directly related to TEMA. The Group of Experts suggested two levels for training human resources:

training courses: these should be short courses on individual aspects covered by the objectives of the three subprojects. They should involve staff participating regularly in relevant national projects in the focal areas.

postgraduate courses: these should lead to master's and doctor's degrees in university establishments in the region, and include research training within the framework of the subprojects.

(iii) Regional symposium

The Group of Experts recommended the organization under IOCARIBE of a specific symposium on research contributions relating directly to the objectives of the three subprojects for specialists from the IOCARIBE region, and also for other regions in the tropical and/or warm temperate zone. The Group of Experts considered that such a symposium would establish a scientific frame of reference and determine the state of the art in achieving the objectives of FEDERP, PREP and CODERP.

(iv) Collation of published information

With regard to the collation of published information, and the detailed design of the three TRODERP projects, the Group of Experts recommended the recruitment of regional consultants for short periods with a view to implementing those actions from the IOCARIBE headquarters.

Additional recommendations

The Group of Experts also adopted the following recommendations:

(i) Resources not covered by the TRODERP subprojects

The three IOCARIBE/TRODERP subprojects do not explicitly include some fishing resources of recognized importance in the region such as crabs, crayfish, squid, etc. The proposed workshop should therefore evaluate the economic importance of those resources and justify and design a specific subproject on their recruitment.

(ii) National projects related to TRODERP

Member States of the region interested in programmes relating to TRODERP might be recommended to expand their own research by framing new projects or by strengthening those already under way in order to increase knowledge of the recruitment of resources in the region. Such action might have a desirable catalytic effect, since ongoing projects and/or projects of a proven scientific calibre would be good channels for international multilateral or bilateral funding.

(iii) A means of strengthening intraregional ties

A mechanism for intraregional communication along the lines recommended for OSLR by the fourteenth IOC Assembly (document IOC-XIV/3), was suggested. That instrument of communication (for example, a bulletin, newsletter or the like) should be centrally edited in the IOC Secretariat for IOCARIBE in Cartagena.

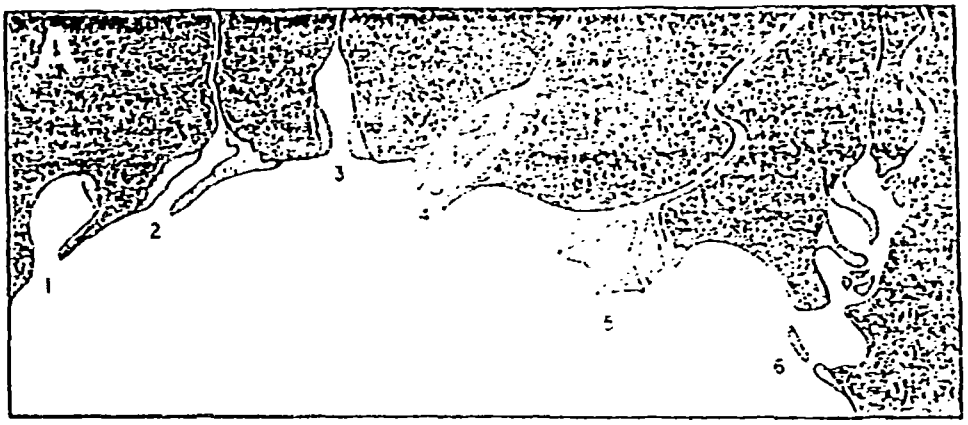
5. ADOPTION OF THE SUMMARY REPORT AND RECOMMENDATIONS

The Group of Experts adopted the summary report of the meeting.

6. CLOSURE

Closing the session, the Chairman of the IOCARIBE Group of Experts for TRODERP spoke on behalf of the scientists taking part, and especially those from abroad, in commending the excellent facilities provided by Colombia and the IOC Secretariat for IOCARIBE, which had ensured that the session proceeded smoothly and successfully. The Chairman of IOCARIBE replied on behalf of Colombia and the Sub-Commission, placing emphasis on the high scientific level of the discussion on the issues addressed during the session, and reiterated his country's support for it and for other IOCARIBE initiatives.

The session ended at 6.30 p.m. on 21 May.



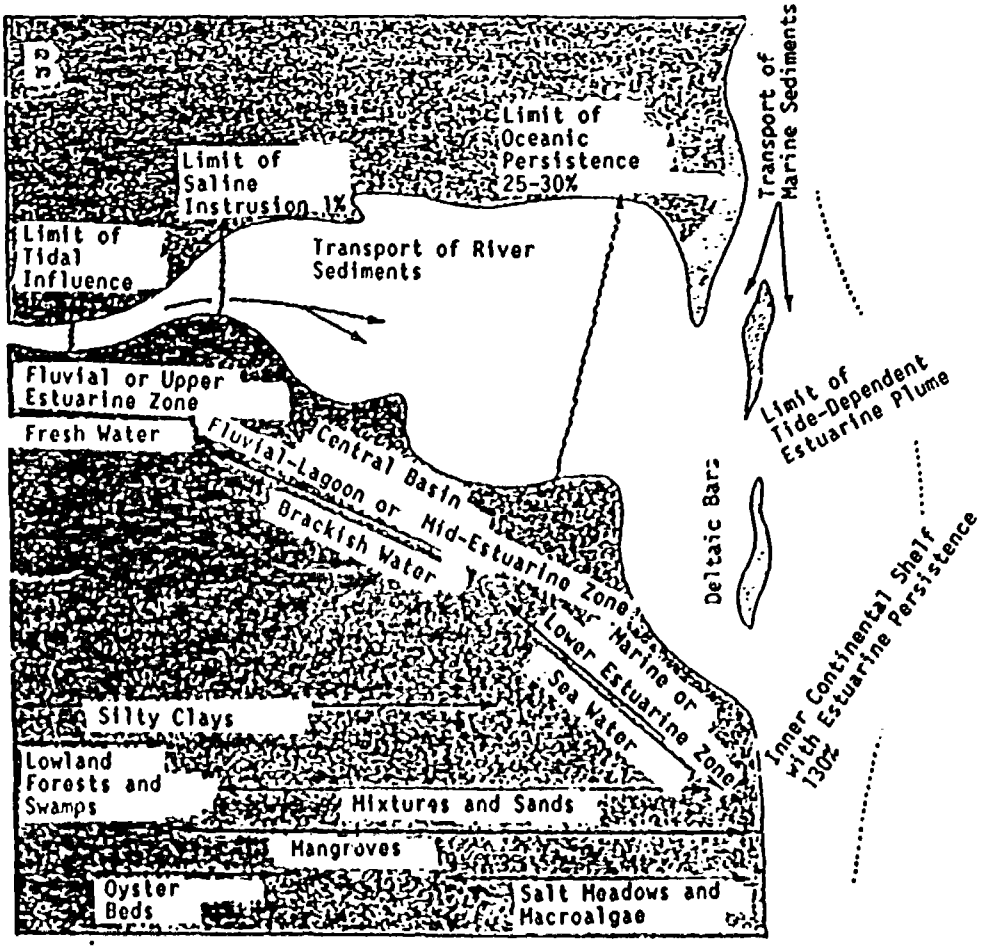


FIGURE 1

1.A
1) Typical lagoon system
2) Lagoon-estuarine system
3) Typical estuarine system
4) Deltaic-estuarine system
5) Deltaic-estuarine system
6) Fluvial-lagoon-deltaic-estuarine system

1.B Lagoon-estuarine environment. The innermost dividing line marks the boundary of tidal influence and not the boundary of saline intrusion, and the outermost dividing line marks the boundary of the influence of the estuarine plume on the continental shelf. These boundaries are transitional zones regulated according to the time of year, climatic conditions and tides. The gradient of the sediments and salt concentration can be divided into three main areas: the upper fresh water estuary affected directly by rivers, the middle estuary or mixed area, and the lower estuary under the direct influence of the sea.

Reference: A. Yanez-Arancibia, 1987, Lagunas Costeras y Estuarios: Cronología, Criterios y Conceptos para una Clasificación Ecológica de Sistemas Costeros (Coastal Lagoons and Estuaries: Chronology, Criteria and Concepts for the Ecological Classification of Coastal Systems) Academy of Science of São Paulo, Brazil, ACIESP Press, Volume 54, No. 3, 38 pages.

ANNEX I

Agenda

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   2.1 Adoption of the agenda

   2.2 Election of the Chairman of the Group of Experts and designation of the Rapporteur for the session

   2.3 Conduct of the session, timetable and documentation

3. CONSIDERATION OF THE RECOMMENDATIONS OF THE WORKSHOP ON RECRUITMENT IN TROPICAL COASTAL DEMERSAL COMMUNITIES AND OTHER OSLR REGIONAL COMPONENTS

   3.1 Tropical Demersal Recruitment Project (TRODERP)

   3.2 Second Western Atlantic Turtle Symposium (WATS-II)

   3.3 Phytoplankton bloom, red tides and associated mortality of marine organisms

4. STRATEGY FOR THE IMPLEMENTATION OF THE ACTIVITIES PLANNED

5. ADOPTION ON THE SUMMARY REPORT AND RECOMMENDATIONS

6. CLOSURE

ANNEX II

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ANNEX III

LIST OF ACRONYMS AND ABBREVIATIONS

CORDERP	Coral Reef Demersal Recruitment Sub-Project (TRODERP)
FAO	Food and Agriculture Organization of the United Nations
FEDERP	Fish Estuarine-Deltaic Recruitment Sub-Project (TRODERP)
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IREP	International Recruitment Experiment
OSLR	Ocean Science and Living Resources (IOC and FAO programme)
PREP	Penaeids Recruitment Sub-Project (TRODERP)
TEMA	Training, Education and Mutual Assistance in the Marine Sciences (IOC Programme)
TRODERP	Tropical Demersal Recruitment Project (of IREP)
UNESCO	United Nations Educational, Scientific and Cultural Organization
WATS-II	Second Western Atlantic Turtle Symposium