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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR) GROUP OF EXPERTS MEETING

Paris, 1-2 December 1997

SUMMARY REPORT

The Assembly at its Eighteenth Session recommended that a plan for the specific development of OSNLR in the framework of the IOC coastal zone strategy be prepared by a small group of experts.

The attached document presents the results of the OSNLR Group of experts meeting that took place in December 1997 in Paris.

Also included is a **proposal relative to the contribution of coastal geoscience to ICAM through OSNLR**, prepared by the IOC Secretariat.

SC-99/CONF.212/CLD.10

Report of the OSNLR Expert Group Meeting
Paris, 1-2 December 1997

Introduction

1. The Expert Group met under the requirements of IOC Resolution XIX-2 and decided to consider non-living resources more widely, as suggested by the Executive Secretary IOC in his letter to Dr. P. Cook, Chairman of the OSNLR Group of Experts.

2. Dr. Cook, aided by Drs. H.-R. Yoo and C. Latouche, IOC Consultants, presented a historical review of OSNLR from the published record. A highlight of its development was acknowledged to be the concept of SETR, a programme including Sedimentary Environments, Eustatic changes, Tectonics and Resources, and also natural and human impacts. From the early 1990s, OSNLR became increasingly focussed on the coastal zone, and this was the topic of the Bordomer conferences in 1993 and 1995. In addition to these conferences and their proceedings, outcomes from OSNLR included palaeogeographic maps/charts for the SW Atlantic and WESTPAC, as well as TEMA-linked workshops. It was recognized that several IOC programmes had, yet unidentified, OSNLR inputs.

3. One of the merits of the meeting was the opportunity it provided for a wide review of IOC programmes and elsewhere in other UNESCO divisions, which address coastal zone issues.

3.1 UNESCO- Coastal Regions and Small Islands Unit (CSI).

Dr. A. Suzuymov, representing CSI on behalf of Dirk Troost, made the following points:

- CSI is a 6-year cross-sectoral project, now in its 2nd year.
- About one third of the funding (increasing) went into the social side, two thirds to natural science.
- It attempts to unite social and natural science, and includes ICAM approaches.
- It has some linked programmes with IOC, e.g. Coastal instability in East Africa - the outcome was considered to be of little practical benefit.
- It has had a successful programme in West Africa, in The Gambia and Senegal, on the subject of coastal erosion.
- Two projects successfully bridged the social-natural gap, one dealing with the degradation of coastal resources in Morocco (US$70,000), the other including a cultural component (submarine archaeology), in Alexandria (US$95,000).
- In the Caribbean, the CSI has adopted a programme on coastal dynamics started in 1989.
- Information gaps identified by CSI include long-term monitoring and linkages to freshwater hydrology.
- CSI see "*scope for OSNLR to act as a bridge into Geological Surveys; OSNLR could work with CSI in the production of guidelines*"; CSI providing the socio-economic input.
- CSI takes over from the science agenda in Land-Ocean Interaction in the Coastal Zone Programme (LOICZ), applying science to coastal management and policy making.
- There is scope for co-operation with CSI on regional on-the-spot projects. Most CSI funds are decentralized.

3.2 IGCP - International Geological Correlation Programme

A summary was given by the Secretary of the Programme, Dr. Babuska, Programme Specialist at the Division of Earth Sciences, UNESCO.

- Three IGCP projects are related to the coastal zone and these may have an **interface with OSNLR**. Project No.396 deals with continental shelves in the Quaternary and is likely to be the most relevant. Another is Project No. 389, Geo-environmental evaluation of the coastal

belts of Arab countries, Mediterranean and Red Sea. Projects No.367 refers to the past climate programme.

3.3 IGBP - International Geosphere-Biosphere Programme

- The meeting noted that *"some of the objectives set out in the IGBP LOICZ Implementation Plan were pertinent to OSNLR"*. In particular, Focus 2 of LOICZ - Reconstruction and Prediction of Coastal Zone Evolution as a consequence of coastal change.

3.4 UNESCO - Earth Science Division

Other related activities in this division are:

- Application of Remote Sensing in Developing Countries using existing technology.
- Geological data handling - a new project, PANGIS - Pan-African Network for Geological Information Systems, has been set up as a data exchange framework with the policy maker in mind. There are plans to do something similar in Asia, SANGIS. The types of data are determined by the regional priorities identified, e.g. degradation of coastal groundwater. There is no coastal/offshore component and this could be an **area for possible co-operation with OSNLR**.
- Capacity building in the earth sciences - training courses, not just for geologists.

3.5 IOC Marine Science inputs to ICAM.

Mr. Haiqing Li, IOC Consultant, reviewed this programme. The core projects are:

- Multidisciplinary study of coastal processes for ICAM;
- Marine science and technology information system for ICAM;
- Methodological development in support of ICAM (**scope for OSNLR input here**);
- Coastal monitoring system for ICAM (links to GOOS). There are many observing systems but some of these are unconnected;
- TEMA - underpins all activities;
- Assessment of scientific needs for capacity building in ICAM.

The implementation of these projects is to be at global and regional levels. **OSNLR should be strongly involved.**

3.6 IOC-GOOS

The main points of the summary given by the GOOS Project Office Director, Dr. C. Summerhayes are as follows:

- GOOS is concerned about how the various activities within IOC interconnect; its ambition is to build better links between the IOC programmes.
- Bathymetry was considered very important; what was the shape of the sea bed?
- There is a need to understand the geological processes acting on the sea bed, e.g. the submarine landslides causing tsunamis. **Only OSNLR can achieve this**.
- In coastal areas, the shape of the sea bed controls the tides. Thus, more effort was needed on the bathymetry of coastal areas.
- Sediment loads are an important topic; e.g. the consequences of the major changes in the Nile discharge are very poorly understood. This is **another important area for OSNLR**.
- The GOOS Coastal Module is not yet well developed. It was officially launched in March 1998 under the chairmanship of Dr. Tom Malone.
- Dr. Summerhayes sees GOOS as being concerned with operational activities. He would prefer to **leave the science to OSLR and OSNLR**.

- Part of GOOS is looking at the sustainability of the coastal system. Therefore there is a need for sedimentologists to look at the modern and recent geological history, and for baseline information. **This is relevant to OSNLR.**
- IOC should be supporting LOICZ in international research activities, bringing nations together to solve scientific problems.
- Strong link between Coastal GOOS and ICAM. **OSNLR is relevant to beach mining, coral reef degradation, construction and siltation.**

3.7 **Pan-African Conference on Sustainable Integrated Coastal Management - PACSICOM**

This programme was reviewed by its co-ordinator, Dr. R. Harger (IOC). The main points to emerge were as follows:

- A recent 3-day meeting in Maputo led to a declaration on regional action/projects.
- The World Bank and other UNESCO divisions might be interested in funding this initiative.
- **OSNLR could run a technical meeting, and come up with 2-3 projects. It should identify the key topic areas.**
- It was difficult to define the boundaries of OSNLR inputs.
- There was a need for a greater emphasis on socio-economics and the application of science.
- There is a need for an integrated statement of intent from UNESCO.

3.8 **IOC Ocean Mapping**

Dr. Dimitri Travin, IOC Consultant, briefly reviewed this item:

- Existing projects were listed: International Bathymetric Chart of Western Indian Ocean, East-Central Atlantic, Mediterranean, Caribbean and Gulf of Mexico, Western pacific.
- New project in Arctic Ocean.
- Geological/Geophysical atlases for the Atlantic, and (next year) the Pacific.

4. **Specific contributions of OSNLR to coastal zone research, observations and management:**

New elements of OSNLR:

- The meeting considered there was little that new elements of OSNLR could add to oil and gas related research. Gas hydrates were a possible area, but according to Dr. Summerhayes the volumes of these resources have been greatly exaggerated.
- There may be scope for research in the use of coastal space resources.
- There was a strong rationale for the application of palaeogeography to the mapping of marine sand and gravel resources.
- Coastal aquifers are considered very important, but there is a question of whether this is strictly ocean science. On balance this should fall within the OSNLR attribution - coastal groundwater and saline intrusion are key ICM issues and it is important to understand coastal geometry.
- Dr. Yoo noted that the first priority was geoscience. OSNLR should identify a "real" topic in the minds of managers and policy makers. 'Coastal Change' may be too large a topic. Better to return to the principles established in SETR.

5. **OSNLR and the 1998 International Year of the Ocean**

- The meeting was urged to look out for photographs as possible illustrations to an OSNLR contribution to an IOC publication.

6. Action List

- IOC is to issue invitation to those members of the OSNLR Guiding Group of Experts that have contributed to the Division for Ocean Affairs and the Law of the Sea (DOALOS) book to a meeting on the role of OSNLR in the deep ocean.
- OSNLR should create its own Home Page on the WWW.
- OSNLR should create its own page for its contribution to IYO.
- OSNLR should decide on the composition of a sub-Guiding Group of Experts for the coastal/near shore element of OSNLR.
- A meeting in 1998 of the above-mentioned sub-Group should be planned.
- IOC should consult on feasibility of the study of areas affected by deltaic sedimentation, e.g. Yellow Sea, southeastern or eastern Mediterranean, South America or Africa.
- OSNLR should maintain dialogue with other IOC and wider UNESCO programmes relating to the coastal zone, identifying the most appropriate contribution from OSNLR.

ANNEX I

PROPOSAL RELATIVE TO THE CONTRIBUTION OF COASTAL GEOSCIENCE TO ICAM THROUGH OSNLR

Prepared by the IOC Secretariat

1. At its Eighteenth Session the Assembly recommended that *"without neglecting other components of the Programme, a plan for the specific development of OSNLR in the framework of the IOC Strategy Relative to Coastal Zone be prepared by a small group of experts".* Pursuant to this recommendation the IOC Secretariat is preparing a proposal whose main objective is to make the coastal zone component of OSNLR one of the major pillars of the Programme. This overall objective will require better links between OSNLR and the global IOC strategy relative to coastal zone as recently been defined in the information document IOC/INF-1051, published in 1997. In the framework of this global IOC strategy, OSNLR can provide the necessary earth science context to integrated coastal area management. Specifically, OSNLR can contribute an integrated approach to physical coastal change through studies of sedimentation, lithology and quaternary palaeogeography and document the effects of human activity on coastal zone physical evolution (information document IOC/INF-1064, 1997).

2. Whilst OSNLR and activities relevant to OSNLR are very often cited in IOC documents as components of ICAM, up to now, OSNLR has rarely participated in specific activities relative to the global IOC Programme on coastal zone. When, in some regions, the geoscience has been the focus topics of meetings (such as the OSNLR Workshop in Brazil, October 1997, or the Workshop on Paleogeographic Maps for WESTPAC, China, May 1997), these activities are mainly considered as relevant to IOCARIBE or WESTPAC Sub-Commissions. In addition, it is often considered that "*Though many of the IOC traditional marine science and ocean services programmes such as OSLR, OSNLR, GIPME, Ocean Mapping, GLOSS, IODE, etc., already represent IOC inputs to ICAM due to their component in the coastal regions, these inputs are basically disciplinary in nature and are not necessarily designed for serving ICAM purposes*" (information document IOC/INF-1051, 1997).

3. On numerous occasions in the past, IOC Governing Bodies have clearly expressed their recommendation for an increased involvement of OSNLR in ICAM/CZM as indicated in the following Resolutions and Recommendation:
1989 - Resolution XVI-11: Co-ordination of Coastal Zone Programmes and Activities;
1992 - Resolution EC-XXV.8: IOC Participation in UNCED;
1993 - Resolution XVII.1: Coastal Zone Activities;
1993 - Resolution XVII.3: Conference on Coastal Change;
1995- Recommendation made by the IOC Assembly in the framework of coastal zone related activities: "*The Assembly urged the strengthening of the present oriented programmes, e.g., OSLR, **OSNLR**, GIPME and others, so as to produce more products from these programmes for users*" (SC/MD/106, para.156).

4. There is clearly a need to define what OSNLR can contribute and to disseminate appropriate information on OSNLR science and objectives. Knowledge on the geomorphological and geological context of the coastal zone is a necessary prerequisite for any study of the coastal zone. Coastal changes are good examples of coastal processes, the knowledge of which is absolutely necessary for ICAM.

5. At the regional level, in addition to the specific cases of activities of WESTPAC and IOCARIBE, marine geosciences are one of the most important aspects of regional activities in Central Eastern Atlantic (sedimentary budget along the coast of Western Africa), in IOCINCWIO (coastal erosion in east African coasts), in South West Atlantic (coastal erosion along the coast of eastern South America).

6. Throughout these activities there are two facets of the question to be considered: (i) the need for studies relative to the coastal zone and, (ii) the contribution to coastal zone management that OSNLR can offer.

Identified Needs:

7. As stated in Document IOC/INF-1051, para.3, 1997:

"the initiation of multidisciplinary marine science programmes with the sole purpose of better understanding coastal processes and generating data for serving ICAM has become extremely necessary", and again in Document IOC/INF-1028, p.3 and 6, 1996:

"GOOS is not a research Programme, although obviously research will continue to be needed to make the observations useful, (...) Monitoring and documenting changes in coastal and near-shore areas require an interdisciplinary approach that integrates physical, chemical, biological and geological observations with socio-economic uses of the coastal zone".

We have learnt from experiences that geological/geosciences data are an essential component of the knowledge required for ICAM.

Possible Contribution of OSNLR

8. Since the beginning of OSNLR, it has been recognized that the coastal zone was the first priority for the programme. The concept of the Coastal Zone as a Resource in its own right (CZAR) was adopted in clear recognition of the strategic and economic value of the coastal zone. In fact this "resource" is under constant threat due to the fact that the coastal zone is in a continuous state of change (IOC/OSNLR Coastal Change Conference, Bordeaux, France, February 1995). These changes linked to hydro-sedimentary processes result either in coastal erosion or sedimentation, both phenomena which alter the economic and aesthetic value of the coastal zone. The understanding of these processes is a necessary prerequisite for any coastal zone management, which in turn reflects on the importance of geosciences processes and OSNLR. However, the understanding of changes has been based on long-term observations that are always very expensive and obviously time-consuming. An alternative can be obtained from earth science. Sediments are very often highly informative on the past coastal processes, including the most recent periods (scale of tens of years). This concept of the "past as a key for the future", is a method from which positive results can be obtained for studying and interpreting past and likely future coastal changes. This is the kind of contribution that OSNLR is in a position to provide to coastal zone management.

9. Another important parameter controlling the coastal zone evolution is the geological characteristics (geomorphology, lithology, mechanical properties) of the coastal zone itself (type of rocks or sediments, slope, mineral resources, etc.). This is the reason why the geological mapping of the coastal zone and adjacent shelf is very often a necessary requirement for coastal zone management.

Conclusion

10. Marine geosciences can provide strategic information on the nature, value and evolution of the coastal zone, including forecasting of future evolution. For this reason, OSNLR has to be an integral part of programmes relative to ICAM and GOOS.

11. Taking into account these fundamental potentialities of OSNLR, the Assembly will be invited to consider ways and means to integrate OSNLR in the global IOC strategy relative to the

coastal zone and for improving the support of OSNLR at global, regional and national levels, particularly for developing countries. Besides the conceptual contribution of geosciences in the context of the knowledge of the coastal zone, it should be underlined that a viable implementation rate of OSNLR components will require funding at a greater level than available at the present time.

12. Such improvements for the programme will require the involvement of governmental agencies. **During the Twentieth Session of the Assembly, the Executive Secretary IOC will be given advice and instructions with respect to the programme adjustment and identification of necessary resources to develop and implement a strengthened OSNLR.**

ANNEX II

LIST OF PARTICIPANTS

Dr. Peter Cook
Chairman, OSNLR
British Geological Survey
Keyworth
Nottingham, NG 12 5GG
United Kingdom
Tel: (44-1159) 363226

Dr. Russel Arthurton
Consultant
29 Church Lane,
Old Dalby,
Melton Mowbray,
Leics LE14 3LB.
Tel/fax: (44 1664) 823796.

Dr. Claude Latouche
Consultant
Tenefort
33710 Mombrier
France
Tel/fax: 05 57 68 35 58

Dr V. Babuska
Division of Earth Sciences,
UNESCO.
1 rue Miollis
75732 Paris cedex 15
France

Dr. Alex Suzuymov
CSI/UNESCO
1 rue Miollis
75732 Paris cedex 15
France

IOC Secretariat

Dr. Hong Rhyong Yoo (OSNLR Technical secretary)

Dr. Colin Summerhayes
GOOS Project Office Director

Dr. Robin Harger
PACSICOM Co-ordinator

Mr. Haiquing Li
ICAM Co-ordinator

Mr. Dimitri Travin
Ocean Mapping

Intergovernmental
Oceanographic Commission
UNESCO
1, rue Miollis
75732 Paris cedex 15
France
Tel: (33 1) 45 68 10 00
Fax: (33 1) 45 68 58 10