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THE BENEFITS OF THE IMPLEMENTATION OF THE GOOS IN THE MEDITERRANEAN REGION

Rabat, Morocco
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Abstract
A MedGOOS Workshop on the "Benefits of the Implementation of the Global Ocean Observing System in the Mediterranean Region" was held on 1-3 November 1999 in Rabat, Morocco. This meeting brought together more than seventy participants, including representatives of institutions from 18 Mediterranean countries, Europe and Africa, as well as from United Nations agencies and international governmental and non-governmental organisations. The workshop was opened and closed by the Secretary of State for Scientific Research of Morocco.

After the Plenary sessions and presentations, the participants were split into working groups.
The results of these working groups constituted the framework for project proposals to be submitted to potential donors and funding agencies. One potential source of funding is the Fifth Framework Programme of the European Union. The GEF of the World Bank is another potential source of funds. Some funds for North African countries may also be obtained through the PACSICOM/African Process for the Development and Protection of the Coastal and Marine Environment.

The Workshop recognized that, while GOOS is a global programme, it would be developed at the local and regional level through programmes such as MedGOOS, EuroGOOS and GOOS□AFRICA. The MedGOOS Strategy was submitted to the workshop participants by the MedGOOS Chairperson, and was approved by the attendees. Several additional countries signed the MedGOOS Memorandum of Understanding (MoU).

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[1] Also available in French. For Budgetary constraints, annexes II, III and IV are not translated.

TABLE OF CONTENTS

page

1. INTRODUCTION 1

1.1 OPENING OF THE MEETING 1

2. ADMINISTRATIVE ARRANGEMENTS 2

2.1 ADOPTION OF THE AGENDA 2

2.2 DESIGNATION OF THE RAPPORTEUR 3

3. PLENARY LECTURES 3

3.1 HIGHLIGHTS OF GOOS 1999 3

3.2 GOOS INTER-REGIONAL COLLABORATION AND THE ROLE OF EuroGOOS IN THE MEDITERRANEAN 4

3.3 THE STRATEGY OF MedGOOS 4

3.4 THE GOOS-AFRICA PERSPECTIVE 5

3.5 OCEAN DATA AND INFORMATION NETWORKS IN AFRICA (ODINAFRICA) 5

3.6 CO-DEVELOPMENT OF TECHNICAL CAPACITIES FOR MedGOOS 6

3.7 NAVAL OPERATIONAL OCEANOGRAPHY 6

3.8 EUROPEAN UNION PROGRAMMES FOR THE MEDITERRANEAN AND OPERATIONAL OCEANOGRAPHY 7

3.8.1 Operational Oceanography in the Fifth Framework Programme of the European Union 7

3.8.2 EC MAST Projects and Results in the Mediterranean Sea 7

3.8.3 CAOS- A Proposed Regional Activity of C-GOOS and MedGOOS 8

4. MEDITERRANEAN PROJECTS 8

4.1 THE MEDITERRANEAN OCEAN FORECASTING SYSTEM (MFSPP): THE FIRST PHASE OF IMPLEMENTATION OF THE MEDITERRANEAN FORECASTING SYSTEM PILOT PROJECT (MFSPP) 8

4.2 IMPORTANCE OF DATA ARCHIVING FOR MedGOOS: THE MAST/MEDAR-MEDATLAS II MEDITERRANEAN DATA ARCHAEOLOGY AND CONCERTED ACTION (MAS3-CT98-0174/IC20-CT98-0103) 8

4.3 MONITORING NETWORK SYSTEM FOR SYSTEMATIC SEA LEVEL MEASUREMENTS IN THE MEDITERRANEAN AND BLACK SEA: UPDATE ON THE STATUS OF THE MedGLOSS SEA-LEVEL PILOT NETWORK 9

4.4 UNEP-MAP: THE MED POL PHASE III PROGRAMME FOR THE ASSESSMENT AND CONTROL OF MARINE POLLUTION IN THE MEDITERRANEAN 10

5. PRESENTATION OF NATIONAL ACTIVITIES OF SOUTH AND EAST MEDITERRANEAN COUNTRIES 10

6. WORKING GROUPS 11

7. PLENARY SESSION 12

8. CLOSURE 12

ANNEXES

I. AGENDA
II. INTERNATIONAL AND NATIONAL ORGANIZING COMMITTEES
III. LIST OF PARTICIPANTS
IV. OPENING ADDRESSES
V. ACRONYMS

1. INTRODUCTION

A workshop analysing the benefits of implementation of the Global Ocean Observing System for the Mediterranean (MedGOOS) was held in Rabat, Morocco from 1 to 3 November 1999, two years after the first IOC workshop on GOOS capacity building for the Mediterranean that took place in Malta, 26-27 November 1997. The preparatory activities leading to the Rabat workshop include a session on MedGOOS development held on 12 March 1999 during the EuroGOOS Conference in Rome, where the institutions forming the MedGOOS Association formally signed a Memorandum of Understanding (MoU) to implement operational oceanography in the region.

The Rabat workshop brought together more than seventy participants, including representatives of institutions from 18 Mediterranean countries, Europe and Africa, as well as from United Nations agencies and international governmental and non-governmental organisations. Many national high-ranking officials including amongst others, the Secrétaire Perpétuel of the Royal Academy and the Secretary of State for Scientific Research of Morocco attended the meeting.

The objectives of the workshop were to:

- Raise the level of awareness of policy makers on the benefits of MedGOOS;
- Broaden participation in MedGOOS to all Mediterranean countries;
- Bring together scientists and representatives of the Institutions involved in operational oceanography in the Mediterranean to avoid overlapping of initiatives and to close gaps;
- Discuss the strategy for MedGOOS;
- Initiate joint pre-operational projects on research and training;
- Initiate joint operational demonstrator projects based on existing systems.

The workshop was organised in three parts:

- Plenary lectures with focus on the global and international programmes;
- National presentations on the GOOS-related activities and projects;
- Working groups.

The results of the working groups constituted the framework for project proposals to be submitted to the Fifth Framework Programme of the European Union.

The opening and closing remarks by the Secretary of State for Scientific Research of Morocco, the Chairperson of MedGOOS and the Director of the GOOS Project Office of IOC/UNESCO, highlighted the need to develop operational oceanography in the Mediterranean to support decision making by Mediterranean nations.

1.1 OPENING OF THE MEETING

The workshop was officially opened at 09:30, Monday 1 November 1999, in the Conference room of the Hotel Tour Hassan of Rabat, Morocco, by the Secretary of State for Scientific Research of Morocco. He welcomed participants and stressed the readiness of the host country to support the development of operational oceanography in the Mediterranean. He recalled the importance of fisheries for his country and pointed out the need for stronger co-operation through capacity building in marine science to support efficient decision making. He thanked the Intergovernmental Oceanographic Commission of UNESCO for its support for the workshop. The Secretary of State

acknowledged the dedication of the Local and International Organizing Committees as well as the efforts of the MedGOOS Secretariat.

Dr. Colin Summerhayes, Director of the GOOS Project Office, welcomed the participants on behalf of the IOC Executive Secretary. He stressed the importance of working together to develop operational oceanography in the Mediterranean as the basis for developing new products and services useful for application in areas such as fisheries, tourism, weather forecasting, port and harbour management, ship routing, offshore industry, coastal construction, and the like. He recalled the various steps that led to the development of the MedGOOS initiative, starting from the Capacity Building workshop organized in Malta by the IOC in 1997, to the signing of the MedGOOS Memorandum of Understanding in Rome, in March 1999, by the Association of MedGOOS countries. He pointed out that MedGOOS is moving forward as one entity within the orbit of GOOS-AFRICA on the one hand, and EuroGOOS on the other hand. In the African context, MedGOOS can address the need to follow up on the proposals to improve Integrated Coastal Area Management that were made at the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM) in Maputo in July 1998. He also pointed out that the best way forward in the development of GOOS for the benefit of all nations is through partnerships, especially regional ones, in which neighbours with common interests can devise and operate shared observational and forecasting systems for mutual benefit. He highlighted the similarity between the World Meteorological Organisation's World Weather Watch programme and the GOOS Programme. He reminded attendees that GOOS is meant to be user-driven, that is, to find out from the user community what it needs to improve its efficiency and effectiveness, and then to devise the products and services to meet those needs. It is not a research exercise, although inevitably some research will be needed to set future operations on a firm footing, and to continually improve operational activities and applications. He also reminded participants of the definition of operational oceanography, which is the ability routinely to determine, for all users, the present state of the sea, and to forecast its future state on an hourly, daily, monthly, seasonal and annual time scale.

The Chairperson of the MedGOOS, Dr. Silvana Vallerga, welcomed the participants and thanked the IOC Secretariat for its support in planing and organizing the workshop. She also thanked the host country and the Local and International Organizing Committees for their comprehensive preparatory work. The Chairperson highlighted the need for the Mediterranean countries to join efforts towards establishment of operational oceanography for the benefit of the region. She recalled the progress made by the region in signing the MedGOOS Memorandum of Understanding and invited the participating countries that had not yet done so to join the MedGOOS Association.

2. ADMINISTRATIVE ARRANGEMENTS

The Chairperson of the Local Organizng Committee, Professor Maria Snoussi, welcomed the participants and provided information on the local arrangements. She thanked the IOC/UNESCO and the sponsors for their support and dedication to the MedGOOS programme. She presented the agenda of the workshop and informed the participants that the workshop would run for three full days, starting at 09:00 and concluding at 18:00 with plenary lectures, presentation of relevant European Community and Mediterranean Programmes, formation of working groups for actions to write workpackages and general discussion on the proposals.

2.1 ADOPTION OF THE AGENDA

The provisional agenda (Annex I) was adopted by the participants.

2.2 DESIGNATION OF THE RAPPORTEUR

The Technical Secretary of MedGOOS from IOC/UNESCO, M. Justin Ahanhanzo, was appointed to serve as Rapporteur for the whole meeting. M. Aldo Drago, Executive Secretary of the MedGOOS Association was designated to assist him.

3. PLENARY LECTURES

3.1 HIGHLIGHTS OF GOOS 1999

The Director of the GOOS Project office, Dr. Summerhayes, presented the Highlights of GOOS 1999. He introduced his lecture recalling that operational oceanography is being developed on the global scale under the aegis of GOOS, which is sponsored by the IOC, WMO, UNEP and ICSU. He particularly stressed the fact that GOOS is a response to the demands of UNCED's Agenda 21. It is designed to provide descriptions of the present state of the sea and its contents, and forecasts of these as far ahead as possible, for a wide range of users. It is also designed to meet the needs of the Framework Convention on Climate Change by underpinning forecasts of changes in climate. GOOS is not solely operational, but it includes work to convert research understanding into operational tools. If well managed, GOOS should provide nations with the ability to convert research results into useful products to meet societal needs.

The GOOS design has now emerged for application by Member States in the form of the GOOS Strategic Plan and Principles, and "The GOOS 1998, a Prospectus for GOOS", which was published by the IOC in November 1998 as GOOS Publication No. 42. Work on the design of GOOS is rapidly drawing to a conclusion and finalised strategies for implementation are expected to emerge during the period 2000-2001. These will deal with specific requirements for monitoring living marine resources, pollution, coastal seas, and climate.

Dr. Summerhayes underlined the ways in which GOOS will differ from most present observing systems (i) in having modelling and forecasting as part of its mandate, as well as the collection of data; (ii) in being holistic, integrated and interdisciplinary, rather than narrow and sectoral; and (iii) in being designed to deliver useful products for both decision makers and the scientific community. GOOS Initial Observing System (GOOS-IOS) unites the main global observing subsystems supported by the IOC, WMO and (in the case of coral reef) the IUCN, and include measurements from ships, buoys, coastal stations and satellites. In addition, as of July 1999, many nations are now contributing substantial parts of their national observing systems to GOOS. Dr. Summerhayes said that the GOOS-IOS is the nucleus from which GOOS will grow in the future. Implementing GOOS will be facilitated by the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). The managers of most of these GOOS-IOS subsystems, including a representative of the IOC's International Data and Information Exchange programme (IODE), will be working through JCOMM to make the GOOS-IOS work.

Dr. Summerhayes pointed out that the 4th Conference of the Parties (COP) to the framework Convention on Climate Change, held in November 1998 in Buenos Aires, agreed on the URGENT need to improve the quality, coverage and management of GOOS, and especially to increase the number of ocean observations, particularly in remote locations. The COP-IV stressed the need for GOOS Pilot projects, such as the Global Ocean Data Assimilation Experiment (GODAE), and its pilot project Argo that will seed the upper ocean with 3000 profiling floats. Dr. Summerhayes reported that the COP-IV also urged Parties and GEF (Global Environment Facility of The World Bank) to help to build capacity in developing countries, to enable them to participate in and benefit from GOOS.

Finally, Dr Summerhayes described the existing GOOS Pilot projects, such as GODAE, PIRATA, and TAO. He concluded that the success of GOOS would depend on activities of the regional GOOS Programmes such as EuroGOOS, NearGOOS, MedGOOS, GOOS-AFRICA, PacificGOOS and IOCARIBE-GOOS.

3.2 GOOS INTER-REGIONAL COLLABORATION AND THE ROLE OF EUROGOOS IN THE MEDITERRANEAN

Dr. N. C. Flemming, Director of EuroGOOS, gave an overview of the EuroGOOS Programme. He began his presentation by stating that it is formally recognised that in addition to the global components of GOOS (Satellite observation systems, global programmes such as IGOSS and DBCP), GOOS should be implemented through regional commitments. This is essential both to provide collaboration between adjacent States that are developing common services in the same sea area, and to facilitate global collaboration between a reasonable number of agencies. He then stressed the fact that GOOS inter-regional policy is an early stage of development. Dr. Flemming pointed out that GOOS regional bodies may consist of a group of countries having a common economic or social interest, or a group of countries surrounding a common sea area, which must be measured, modelled, and managed as a natural and scientific unit. Thus, GOOS-AFRICA consists of countries facing several oceans, while MedGOOS is a group of countries surrounding a single sea.

EuroGOOS is a mixed region, since internally there are closed sea areas, such as the Baltic, surrounded by States, and externally EuroGOOS is a group of countries facing onto two oceans and one sea, the Arctic, Atlantic, and Mediterranean.

Dr. Flemming pointed out that it is natural and logical that some countries should belong to two GOOS regions. Countries on the southern shores of Europe belong to both EuroGOOS and MedGOOS. Countries on the northern coast of Africa can belong to both GOOS-Africa and MedGOOS. Regional data gathering and the development of useful marine data products and forecasts benefit from data and products delivered by a global system, and by exchanging data and products as rapidly as possible with adjacent regions. In the Mediterranean, modellers benefit from data generated from the Atlantic (North or South), and hence from the activities of both GOOS-AFRICA and EuroGOOS, and, by implication, from North American and the Caribbean.

He emphasised that EuroGOOS needs to work in the Mediterranean for its own sake, to provide data and forecasts for the southern European countries, but this immediately leads to the realisation that the Mediterranean can and should be treated as a unit, measured, monitored, and modelled according to one set of criteria. This being the case, EuroGOOS and MedGOOS have certain aims and objectives which are identical. In addition, each region has specific objectives related to sub-regions, or to special social and economic conditions, which are different.

In conclusion, Dr Flemming stressed the need for EuroGOOS and MedGOOS to collaborate on common objectives, especially the observations and models needed for representing the entire basin, and encouraged separate developments at sub-regional and local levels. EuroGOOS, said Dr. Flemming will, at all times, seek to act as a partner to MedGOOS and to respond to requests for collaboration.

3.3 THE STRATEGY OF MEDGOOS.

Dr. Vallerga, the Chairperson of MedGOOS, recalled that the IOC established the MedGOOS in November 1997 and two years later, fifteen Mediterranean Institutions, located in thirteen countries, signed a Memorandum of Understanding to establish an informal Association for the

implementation of the GOOS in the Mediterranean basin. A target is twenty Members for the year 2000.

The strategy for the implementation of MedGOOS envisages five steps to be implemented by the year 2001: (i) raising of awareness, (ii) broadening of the Association; (iii) identification of needs; (iv) capacity building; (v) joint pre-operational projects. To meet the above requirements, the expected outputs of the Rabat workshop are to provide indications on the needs of the Mediterranean countries in terms of GOOS, to identify resources, and together to initiate projects for capacity building. The science, technology and socio-economic bases of the MedGOOS will initially be approached together with the EuroGOOS, to which the MedGOOS forms an important complement. Dr. Vallerga indicated that the science plan for the MedGOOS is already under development within the framework of the Mediterranean Forecasting System Pilot Project- MFSPP which is halfway through phase 1, with funding by the EC MAST III Programme. The goal of MFSPP is to explore, model and quantify the potential predictability of the ecosystem fluctuations at the level of primary producers in the Mediterranean Sea at time scales, from weeks to months. Broader participation of South Mediterranean partners in phase II of the MFSPP will be fostered.

3.4 THE GOOS-AFRICA PERSPECTIVE

Professor Brundrit, Chairperson of GOOS-AFRICA, presented GOOS-AFRICA and its objectives. GOOS-AFRICA seeks to improve and strengthen marine data acquisition, analysis and interpretation capabilities in Africa. GOOS-AFRICA recognises that marine data and information, especially the location of resources, trends in environmental change and forecasts of extreme events, are essential aids in decision making related to such basic human needs as food security, health, shelter, water and energy. The implementation of GOOS-AFRICA will also contribute to improving opportunities for creation of wealth through offshore and coastal industry, marine trade, mariculture and aquaculture, and tourism.

Dr. Brundrit pointed out that GOOS-AFRICA has a hierarchical structure. National committees will articulate user needs, develop plans for operational oceanography in respect of environmental processes and living resources at sea and along the coast, facilitate data acquisition for the national agencies responsible, and promote product application and dissemination. Regional GOOS bodies will bring together existing initiatives, strengthen regional capabilities, develop further regional pilot projects, and encourage capacity building. A Co-ordinating Committee for GOOS-AFRICA will oversee the development of GOOS in Africa, and will provide the necessary liaison with international GOOS activities and other partners in GOOS.

3.5 OCEAN DATA AND INFORMATION NETWORKS IN AFRICA (ODINAFRICA)

Mr. M. Odido presented the highlights of the project on the Regional Cooperation in Scientific Information Exchange in the Western Indian Ocean (RECOSCIX-WIO). This project was initiated by the IOC/UNESCO in 1989 to provide marine scientists in the western Indian Ocean region (IOCINCWIO) with access to literature and to promote intra and inter-regional communications. Co-ordinated from a regional Dispatch Centre located at the Kenya Marine & Fisheries Research Institute in Mombasa, this project comprises a network of collaborating marine science institutions in the region and several libraries worldwide. Mr. Odido listed the services provided in the framework of this project such as bibliographic search, document delivery, and subscription to ASFA. The project produced a catalogue of holdings of marine science libraries in the region, a directory of marine scientists, a database of marine species of Eastern Africa and a CD-ROM containing oceanographic data from the region.

Mr. Odido said that a similar project entitled Regional Cooperation in Scientific Information Exchange in the Central Eastern Atlantic (RECOSCIX-CEA) has recently been launched with the regional co-ordinating centre at the Centre de Recherches Océanographiques (CRO), in Abidjan, Côte d'Ivoire. He stressed that much still need to be done to make this network fully operational.

Mr. Odido pointed out that as a follow-up to the Third Session of IOCINCWIO, a project entitled Ocean Data Information Network in Eastern Africa (ODINEA) was set up in order to establish and strengthen National Oceanographic Data Centres (NODCs). He informed the workshop that such centres are now established in Kenya, Mauritius, Mozambique, Seychelles, South Africa and Tanzania. Training and internship for data centre managers have been provided, together with equipment and seed funds to get the centres running.

Finally, Mr. Odido pointed out that the three projects RECOSCIX-WIO, RECOSCIX-CEA and ODINEA are funded through the IOC/SIDA-SAREC regional programmes, and the IOC/Flanders Agreement on development of an Ocean Data and Information Network in Africa (ODINAFRICA).

3.6 CO-DEVELOPMENT OF TECHNICAL CAPACITIES FOR MEDGOOS

Dr. Stel, from Holland, the Chair of the ad hoc GOOS Capacity Building Panel, started his presentation by setting the background for the implementation of both UNCED's programme of actions listed under Agenda 21 and UNCLOS's various provisions, reflecting rights and obligations of countries. He pointed out the implication of the exploration and exploitation of the Exclusive Economic Zone (EEZ), with the Coastal Zone Management schemes based on science and technology development. He recalled that the major funding mechanism for UNCED is the Global Environment Facility (GEF) which is a joint programme of The World Bank, UNEP, and UNDP. He pointed out that the first phase of GEF (1992-1995) was funded with some US $1.6 billion. For the second restructured phase, 26 countries, including eight developing countries have committed US $2 billion.

Dr. Stel referred to the Potsdam meeting on capacity building activities and pointed out that partnership approach is an important innovative instrument for capacity building. He also pointed out that partnerships are based upon the mutual interest (learning by doing) of the scientific communities of the partners in the industrialised and southern countries. He stressed that capacity building activities, as part of a long-term (10 years) bi- or multilateral commitment to join scientific research or operational programmes are an intrinsic part of the partnership programmes. He emphasised the fact that the funding for the capacity building activities is sought through national and international Official Development Aid (ODA) organisations as well as sources such as the European Union, The World Bank, Asian Development Bank, African Development Bank, and GEF.

Finally Dr. Stel listed a number of elements to consider for the development and strengthening of a marine research capability among which are (i) human resources at the level of individual scientist, (ii) the necessary institutions, and (iii) an enabling national environment that is willing to support and sustain a marine research activity.

3.7 NAVAL OPERATIONAL OCEANOGRAPHY

Dr. R. Beach, of the U.S. Office of Naval Research (ONR), presented a paper on "Achieving Robust Operational METOC Forecasts by increasing Operational Evaluations". His talk provided insight into operational centres run by the U.S. Navy, and stressed a new level of international cooperation designed to spur advances and set priorities for METOC research. He pointed out that

the U.S. Naval Operational Forecast Centres' goals have considerable overlap with those in the civilian community, namely to provide real-time nowcasts and forecasts of Meteorological and Oceanographic Conditions (METOC) by use for its customers.

Dr. Beach focussed his presentation on two complementary methodological processes used to achieve the goals of robust operational forecasts.

The first process is a broader dissemination of U.S. Navy operational METOC products to international applied/basic scientists for use in enhancing internationally funded oceanic and atmospheric research. Access to these real-time products, is granted on a case-by-case basis in exchange for evaluations of their performance.

The second process focuses on enabling feedback from operational customers. There is a strong consensus to increase the number and quality of operational evaluations, and to collate and to share them in digital form. The Internet is an appropriate tool to provide a rich forum for collecting feedback via web-based evaluation forms designed for each model product.

If integrated into the operational forecast process, the digital feedback would provide a quantitative time-history of model tendencies/biases/performance as well as product preference/usage, and can be used to set priorities for model improvements and new product development.

3.8 EUROPEAN UNION PROGRAMMES FOR THE MEDITERRANEAN AND OPERATIONAL OCEANOGRAPHY

3.8.1 Operational Oceanography in the Fifth Framework Programme of the European Union

In his presentation, Dr. A. Edwards from Directorate General, DG-12 of the European Commission noted that operational oceanography is an important topic in the "Environment and Sustainable Development " thematic programme of the European Community's 5th Framework Programme (FR5). Under the "Global Change, Climate and Biodiversity" key Action (KA), one of the priorities is to support the development of the European component of the Global Observation Systems for Climate, Land and Oceans". The aim is to facilitate safe, sustainable offshore operations within given environmental constraints, and to develop the necessary components of an appropriate marine observation system. In the FP5, there are opportunities in the field of technological development, for example in developing communication, monitoring, surveying and imaging systems.

Dr. Edwards highlighted the timescales and methodologies involved in submitting a proposal under FP5.

3.8.2 EC MAST Projects and Results in the Mediterranean Sea

Dr. E. Lipiatou, also from DG-XII presented an overview on the EC's MAST programmes, under the MAST Programme, the European Commission launched a large-scale project, the Mediterranean Targeted Project (MTP, 1993-1999), and several other projects in order to understand the functioning of the Mediterranean Sea. Many advanced courses and workshops were organised. Fellowships were granted to the European students to reinforce research capacity in the participating countries. As results of these projects, the European laboratories and universities built large-scale models explaining long-term changes in the Mediterranean Sea. These results will be used to monitor changes and forecast future developments, to improve knowledge of water circulation and the functioning of the Mediterranean ecosystems, and to homogenise applicable methodologies. The results would also be used to improve socio-economic studies and to enhance

the visibility of the EC efforts in science at the international level. She concluded that the MTP and other EC projects in the Mediterranean Sea provide opportunities for cooperation with non-European Union neighbouring countries.

3.8.3 CAOS- A Proposed Regional Activity of C-GOOS and MedGOOS

Dr. N. Smodlaka, from Croatia described the Co-ordinated Adriatic Observing System (CAOS). This project is an initiative of marine scientists from three countries bordering the Adriatic Sea (Croatia, Italy, and Slovenia) in their efforts to embark on implementing the coastal module of GOOS.

The Adriatic Sea exhibits manifestations of regional and global environmental problems that are amenable to sampling with new technologies. The CAOS project was initiated in 1998 in order to develop sampling for core parameters compatible with the GOOS requirements and principles. To make CAOS operational, a first step is the good co-ordination of existing national monitoring projects and their improvement to meet the needs of the Coastal GOOS and the MedGOOS. The long collaboration established between the three countries involved in research and monitoring of the Adriatic Sea will help to obtain political and financial support from the Member States. The major issues identified to be studied in the framework of the CAOS project are mucilage, oxygen depletion of bottom waters, harmful algal blooms (HABs), and several aspects of fisheries in the Adriatic Sea.

4. MEDITERRANEAN PROJECTS

4.1 THE MEDITERRANEAN OCEAN FORECASTING SYSTEM (MFSPP): THE FIRST PHASE OF IMPLEMENTATION OF THE MEDITERRANEAN FORECASTING SYSTEM PILOT PROJECT (MFSPP)

Dr. N. Pinardi, from Italy, outlined the MFSPP project, which is in a phase of completion. The project consists of: (i) elements of a large-scale automatic observing system with near real time data release through Internet and GTS; (ii) a modelling and data assimilation component which initialises basin wide weekly forecasts; (iii) a coastal modelling down-scaling component which uses the basin-wide forecasts to initialise regional and shelf models; (iv) an ecosystem modelling component for selected test-site shelf areas; (v) an experimental user community which can access and use both the observations and nowcasting/forecasting information.

The MFSPP started its VOS-XBT data collection in September 1999, and the moored buoy M3A test site should have been completed by December 1999. The satellite sea surface height anomalies from January 1998 and the OGCM simulations are already available, and the regional shelf models have been implemented. It is hoped that in future the observing system will be completed with more *in situ* measuring platforms, such as more M3A moored buoys and a system of drifting buoys, surface and subsurface. Ecosystem models are also being implemented in the context of the MFSPP. The basic forecasting work at the hydrodynamics level will serve as initial platform to start predictions at the level of primary producer's variability in the coastal areas.

4.2 IMPORTANCE OF DATA ARCHIVING FOR MEDGOOS: THE MAST/MEDAR-MEDATLAS II MEDITERRANEAN DATA ARCHAEOLOGY AND CONCERTED ACTION (MAS3-CT98-0174/IC20-CT98-0103)

Dr. C. Maillard, from IFREMER, gave a presentation on the MAST/MEDAR-MEDATLAS II project. The objective of this project is to rescue, safeguard and to make available a comprehensive data set of collected oceanographic parameters such as dissolved oxygen, nutrients, temperature and

salinity in the Mediterranean and Black Sea, through a wide co-operation of the Mediterranean countries in the framework of the European MAST (Marine Science and Technology) Programme.

The MEDAR Group brings together the National Data Centres or Designated National Agencies (NODC/DNA) of Algeria, Bulgaria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta, Morocco, Russia, Spain, Turkey, Ukraine, the international Organisations including IOC/UNESCO and ICES, and modelling centres in Belgium and Italy. There is a co-operation with the international Global Ocean Data Archaeology Rescue (GODAR) project in Croatia and other Mediterranean countries.

Dr. Maillard concluded that the MEDAR/MEDATLAS project will contribute to the development of archiving structure and methodology to qualify the new data collected and to develop sustainable regional capacity building for the Mediterranean scientific and operational programmes. She informed the participants that the outlines and results of the projects could be found in Science vol. 279 of 23 January 1998.

4.3 MONITORING NETWORK SYSTEM FOR SYSTEMATIC SEA LEVEL MEASUREMENTS IN THE MEDITERRANEAN AND BLACK SEA: UPDATE ON THE STATUS OF THE MEDGLOSS SEA-LEVEL PILOT NETWORK

Mr. D. Rosen, form Israel presented this topic. The IOC and the International Commission for the Scientific Exploration of the Mediterranean Sea (ICSEM) agreed in 1996 to jointly co-operate in the study of sea level by establishing a long-term monitoring network system for systematic sea-level measurements in the Mediterranean and Black Sea. The programme is entitled MedGLOSS (Mediterranean regional subsystem of the Global Sea Level Observing System). The programme is developed by applying basic GLOSS requirements and methodology and, aimed at providing high quality standardized data, which could then be directly applied for the various regional and worldwide studies.

A preliminary expert workshop on MedGLOSS was held jointly by ICSEM and IOC at ICSEM Headquarters in Monaco in February 1996. In the summer of 1996 a Memorandum of Understanding was signed between IOC and ICSEM, establishing a joint Group of Experts on the MedGLOSS programme. A pilot network was initially planned to include some 27 stations in 13 countries, which have expressed their interest in joining this international research network. The pilot network consists of five GLOSS sea-level monitoring stations located in the basin area, and a limited number of sea-level monitoring stations located in the participating countries.

The pilot plan called for a minimum of two visits of 3-5 days, and GPS missions and absolute gravimetry at all selected sites, of which a limited number were planned to become permanent GPS stations. The sea level stations should provide hourly sea level and atmospheric pressure data daily, via near real time monitoring, communication and presentation system.

Purchase and installation of digital sea-level stations equipped as recommended by the MedGLOSS joint Group of Experts (digital sea level and atmospheric pressure sensors, gathering computer with modem) are underway for Romania, Croatia and Malta. At the EuroGOOS Conference and MedGOOS MoU signing in Rome in March 1999, a number of Member States set up preliminary plans to submit a joint proposal to the Fifth Framework Programme of the European Union to fund further activities under MedGLOSS.

4.4 UNEP-MAP: THE MED POL PHASE III PROGRAMME FOR THE ASSESSMENT AND CONTROL OF MARINE POLLUTION IN THE MEDITERRANEAN

Mr. F. S. Civili, Co-ordinator of the MED POL Programme of the UNEP Mediterranean Action Plan, presented this topic.

A regional marine pollution programme for the Mediterranean (MED POL) has been co-ordinated by the United Nations Environment Programme (UNEP) since 1975. MED POL is implemented as environmental assessment component of the Mediterranean Action Plan (MAP). The other components of this Action Plan are legal (Barcelona Convention and Protocols) and socio-economic (environment-development scenarios).

The first phase of the Programme (MED POL Phase I, 1975-1981) focussed on strengthening the capabilities of over 100 Mediterranean laboratories for the monitoring of chemical contaminants (heavy metals, halogenated hydrocarbons, petroleum hydrocarbons) and the microbiological quality of bathing waters.

During the second phase of the programme (MED POL II, 1982-1995) national marine pollution monitoring programmes were adopted and implemented in most Mediterranean countries. Support is given to national capabilities with great emphasis on data quality assurance and intercalibration and equipment maintenance programmes. Research programmes contributing to the improved understanding of the effects of pollutants, were implemented through more than 500 research contracts with national institutions in most Mediterranean countries.

In 1996, the Mediterranean governments approved a third phase of the Programme (MED POL Phase III, 1996-2005), as part of the Action Plan for the Protection of the Marine Environment and Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II). The new phase of MED POL shifts the emphasis of monitoring from pollution assessment to pollution reduction and control. In parallel to continued activities related to the assessment of pollution levels, MEDPOL III provided the scientific basis for the implementation of the protocols to the Barcelona Convention, in particular the one related to the control of Land Based Sources and Activities (1995 LBS Protocol), and of the Strategic Action Programme to address pollution from Land-based activities, adopted in 1997. The Programme then becomes closer to the objectives of MAP Phase II, as an effective tool for achieving sustainable development.

Dr. Civili concluded that in the context of the MED POL Phase III Programme, two types of monitoring are being developed, trend monitoring and biological effects monitoring, as part of the assessment, and compliance monitoring as part of the control component of the Programme.

5. PRESENTATION OF NATIONAL ACTIVITIES OF SOUTH AND EAST MEDITERRANEAN COUNTRIES

The representatives from Algeria, Bosnia Herzegovina, Croatia, Egypt, France, Italy, Libya, Morocco, Palestine, Slovenia and Tunisia presented the outlines of their national GOOS -related activities. These national presentations were published in the Abstract book of the workshop, requests for which should be addressed to the Chairperson of the Local Organizing Committee, Dr. M. Snoussi (see the address in Annex IV).

6. WORKING GROUPS

Under the leadership of the Chairperson, Dr. S. Vallerga, the participants broke up into three working groups. The objective of working group (1), on networking for sharing resources, chaired by Dr. C. Maillard, was to identify mechanisms for reinforcing co-operation amongst the Mediterranean research institutions. Working group (2), on capacity building was chaired by Dr. S. Vallerga and aimed at assessing the needs and requirements for capacity building. This group was required to explore potential projects to be submitted to donors for funding. Working group (3), chaired by Dr. Tziavos, was asked to seek avenues for consolidation and expansion of the observing systems. A Plenary session was organised to discuss the findings of the three groups and to integrate them into coherent packages for project proposals.

Working Group -1: Networking for sharing resources

The group identified the following key resources to be shared: data, information, products and software.

Key issues involved are:

- Capacity for participating countries to contribute to real time data, and dissemination of the information;
- Real time data integration and their circulation;
- Communication: how the non-specialist could get access to the data.

Identification of what is needed to achieve the above:

- Infrastructures: Concept of the NODC/DNA as focal points. (IOC IODE Programme);
- Nature of the data: Basic data: physical oceanographic and meteorological data;
- Technological support: Internet (e-mail, www);
- Computation means (safeguarding and back up structures);
- Data management software (cataloguing, formatting, processing, visualisation);
- Products: common catalogues, common basic data sets;
- Exchange of model data/products;
- Human expertise: qualification for data management.

Working Group -2: Capacity building

The group assessed the state of the art: What is the level of networking between institutions in the region. To answer this question, the group came to the conclusion that it is important to have a clear picture of existing resources and data centres.

Minimum requirements for the region:

Communication requirements: e-mail, computer capabilities, www, homepage, human expertise, data sets and NODC.

Resources Needed:

(a) human
(b) technical
(c) institutional

Tools and methodologies for reinforcing human and institutional building:

(a) on-the-job training
(b) courses
(c) exchanges

Demonstration projects and awareness creation are needed to show the socio-economic benefits of MedGOOS to the users community.

Working Group -3: Consolidation of observing systems

The group pointed out that there is a need to specify existing systems according to their lifetime and full implementation scale: short/medium and long term. The group reviewed the existing systems in the region. Many gaps were identified, for example in using ships of opportunity to gather data on the temperature and salinity of the upper ocean. It was also clear that many countries make little use of the abundant data obtained by the satellites that over-fly the region. It was recommended that all interested Mediterranean countries consider working together to develop a full suite of complementary observing elements.

7. PLENARY SESSION

The participants discussed the findings of the working groups. During this session, a question on data exchange policy was also addressed. Should MedGOOS opt for total liberalisation, semi-liberalisation or restricted data exchange policy. The participants reached a consensus according to which, the current IOC data policy exchange seems to be appropriate to meet regional needs.

A team was set up under the leadership of the Chairperson, S. Vallerga to put the work packages of the working groups in the format of project proposals to be submitted in the context of the Fifth Framework of the European Union Programme in the year 2000.

The plenary session found that capacity building is a common challenge for the three working groups. The participants stressed the importance of the coastal studies and recommended drawing up proposals for coastal ocean observing and monitoring systems.

A number of participating countries signed the Memorandum of Understanding and formally became members of the MedGOOS Association.

The Member States were requested to provide full support to MedGOOS programmes and initiatives.

8. CLOSURE

The Secretary of State for Scientific Research of Morocco, the Chairperson of the MedGOOS, and the Director of the GOOS Project Office, made the closing remarks in which they emphasised the need for co-operation in the region to develop observing systems for the common good. The Secretary of State thanked the IOC/UNESCO, the MedGOOS Secretariat and the participants for their hard work in developing the work packages to serve as a basis for MedGOOS projects. The Chairperson thanked the IOC/UNESCO for its support in organising the workshop, and encouraged the MedGOOS countries to provide support for the development of the project proposals. She also thanked the Local Organizing Committee for the facilities and services provided during the workshop. The Director of the GOOS Project Office thanked the host country for its enthusiastic support. He thanked the sponsors for their generous support, without which this workshop bringing most of the Mediterranean countries together could not have taken place.

ANNEX I

AGENDA

MedGOOS:
Benefits of the Implementation of the Global Ocean Observing System in the Mediterranean Region
Hotel Tour Hassan, Rabat. Morocco
1 – 3 November 1999

Sunday 31 October

17:00 – 18:00	Registration
18:30 – 20:00	Welcome Reception

Monday 1 November

08:00 – 09:00	Registration
09:00 – 09:45	Opening Ceremony
09:45 – 11:15	**Plenary lectures** Highlights of GOOS 1999 GOOS inter-regional collaboration and the role of EuroGOOS in the Mediterranean The strategy of MedGOOS The GOOS-Africa perspective ODINAFRICA Co-development of Technical Capacities for MedGOOS
11:15 – 11:45	Coffee Break
11:45 – 13:30	**Mediterranean Projects** The Mediterranean Forecasting System Pilot project MEDAR-MedAtlas, MedGLOSS, Med POL/UNEP – MAP
13:30	Lunch
15:00-16:30	Presentation of National activities of South and East Mediterranean Countries
16:30-17:00	Coffee Break
17:00-18:00	EU Programmes for the Mediterranean and Operational Oceanography EESD EC MAST MEDA INCO

Tuesday 2 November

09:00-09:30	Naval Operational Oceanography CAOS
09:30-10:30	Formation of the working groups for actions to start the implementation of MedGOOS
10:30-11:00	Coffee Break
11:00-13:30	Meetings of Working Groups
13:30-15:00	Lunch
15:00-16:00	Meetings of Working Groups
16:00-16:30	Coffee Break
16:30-18:00	Meetings of Working Groups

Wednesday 3 November

09:00-10:30	Writing of work packages
10:30-11:00	Coffee Break
11:00-13:30	Writing of work packages
13:30-15:00	Lunch
15:00-16:30	Plenary discussion on the proposal and recommendations
16:30-17:00	Coffee Break
17:00	Closure of the workshop

ANNEX II

THE INTERNATIONAL ORGANIZING COMMITTEE

Ahanhanzo J. Secretary of the International Organizing Committee, IOC/UNESCO

Brundrit G. (Chairman of GOOS-AFRICA and Co-chair of the Workshop)

Civili F.S. UNEP

Drago A. Executive Secretary of MedGOOS

Flemming N. Director of EuroGOOS

Halim Y. Member of HOTO Panel

Kullenberg G. Executive Director of the International Ocean Institute

Snoussi M. (Chairperson of the Local Organising Committee)

Stel J. Former Chair of the ad hoc GOOS Capacity Building Panel,
Director of NWO Geosciences Foundation

Summerhayes C. Director of the GOOS Project Office, IOC/UNESCO

Vallerga S. Chairperson of the MedGOOS and Co-chairperson of the Workshop

THE NATIONAL ORGANIZING COMMITTEE

Belcadi S.

Boucham

Bouksim Orbi H.

Dahhou M.

Hatimi N. El.

Hilmi Anmar, B.K.

Labraimi M.

Merzouk A.

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Snoussi M. (Chairperson)

Tabet N.

Tber Y.

ANNEX III

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ANNEX IV

OPENING ADDRESSES

Address by
The Secretary of State for Scientific Research of Morocco

Messieurs les Ministres
Monsieur le Représentant de la Commission Océnographique Intergouvernementale de l'UNESCO
Madame la Présidente de MedGOOS

Mesdames et Messieurs,

Je voudrais tout d'abord, présenter à tous les participants les excuses de Monsieur le Premier Ministre. Des engagements ont fait qu'il ne soit parmi nous ce matin pour présider cette cérémonie d'ouverture ; et je voudrais présenter, ensuite, nos remerciements à l'UNESCO et à sa Commission océanographique intergouvernementale d'avoir choisi notre pays pour organiser cet atelier régional sur le Système Mondial d'Observation de l'Océan au profit des pays du bassin méditerranéen, intitulé **"Les bénéfices de l'Application du Système Mondial de l'Observation de l'Océan dans la Région Méditerranéenne"**.

Je voudrais également saisir cette occasion pour remercier tous ceux qui ont répondu à notre invitation par leur présence et souhaiter la bienvenue aux participants étrangers, ceux venant des pays du pourtour de la Méditerranée ainsi que ceux venant des pays non méditerranéens.

Mesdames et Messieurs

Le Maroc, avec ses deux façades maritimes, l'une sur l'Atlantique et l'autre sur la Méditerranée et avec 3500 Km de côtes environ, est un pays dont la vocation maritime est évidente.

Par sa situation géographique, à la porte occidentale de la Méditerranée, au Nord-Ouest de l'Afrique et à quelques kilomètres de l'Europe, notre pays occupe une position privilégiée dans le cadre des échanges internationaux. Ce rôle de « carrefour maritime » qu'il a assuré au cours de son histoire d'Etat millénaire, se développe de plus en plus pour la promotion des échanges Nord-Sud, particulièrement dans le cadre euro-méditerranéen.

Le thème que vous avez choisi pour votre atelier est d'un intérêt certain, puisqu'il se fixe comme objectif principal la mise en place d'un système d'acquisition, d'analyse, de traitement et d'interprétation des données environnementales dans la perspective d'une gestion intégrée et durable des zones côtières et marines du bassin méditerranéen, et les retombées socio-économiques et financières qu'elle peut initier.

Votre atelier est en fait un véritable chantier. Il constitue une composante régionale d'un programme international ambitieux que la Commission océanographique intergouvernementale (COI) de l'UNESCO a préparé et qu'elle est en train de réaliser à l'échelle mondiale.

Notre pays a le privilège d'abriter aujourd'hui la première réunion de la composante régionale de ce programme qui est MedGOOS.

Le but de ce programme est donc de mettre en place un cadre global permanent d'observations, de modélisations et d'analyses des variables océaniques, dans le but de fournir aux décideurs et aux opérateurs socio-économiques, des services à moindre coût et de générer, à partir des activités marines, les ressources nécessaires au développement durable de nos pays, telles que la pêche, le commerce international, le transport maritime, le tourisme, la santé publique, la prévision climatique, la sécurité en mer, la sauvegarde de l'environnement marin, la conservation des espèces, la gestion des ressources énergétiques, etc.

A titre d'exemple, la production halieutique nationale pour l'année 1998 est estimée à 700000 tonnes, soit une valeur de 4,9 milliards de dirhams ce qui correspond à environ 1,4% du PIB, et que le nombre d'emplois directs et indirects générés dans ce secteur est d'environ 400 000.

La production halieutique au niveau de la Méditerranée ne représente en fait que 4,3% de la production nationale, ce qui signifie qu'il y a une surexploitation le long de de la côte atlantique par rapport à celle de la Méditerranée. Un effort doit être consenti pour une meilleure gestion de ces ressources halieutiques.

Et pour contribuer avec vous à la réflexion sur le thème de cet atelier, nous vous proposons l'idée de la création d'un observatoire scientifique du littoral méditerranéen placé sous l'égide de l'UNESCO et domicilié dans un pays sud méditerranéen. Ses objectifs essentiels seraient de mener des études de génie littoral, d'acquérir des données et informations marines, de suivre l'évolution du littoral, et de fournir des outils d'aide à la décision à tous les opérateurs et utilisateurs de la zone littorale méditerranéenne.

Mesdames et Messieurs,

Nous sommes aujourd'hui particulièrement honorés d'inaugurer les travaux de cet atelier régional qui contribuera, sans doute, au renforcement des liens de coopération dans le domaine de la recherche scientifique et de la formation en océanographie opérationnelle entre les différents pays du pourtour de la Méditerranée.

La tenue de cette manifestation est redevable au travail important accompli par les Comités international et national d'organisation. Je saisis cette occasion pour leur rendre un vibrant hommage et leur présenter mes félicitations pour l'effort accompli et la réussite de cette manifestation.

Notre pays accorde une grande importance à **la recherche scientifique et au partenariat technologique** dans le domaine marin en général et au **Programme d'Observation permanente de l'Océan et des Zones Côtières** en particulier, **notamment au profit des pays riverains de la Méditerranée.**

Dans le cadre de MedGOOS, il s'agira de développer la contribution des activités maritimes au PNB, particulièrement pour les Etats côtiers de la rive Sud de la Méditerranée ; de promouvoir l'emploi et le transfert des technologies adaptées dans le domaine de l'observation, de l'exploitation et de la protection de l'environnement marin.

Notre pays ne peut que souscrire à ces objectifs et encourager la coopération multilatérale pour l'accès à l'information et à l'équipement, la multiplication des contacts et des ateliers entre la communauté scientifique et les décideurs, notamment les professionnels de la mer et leurs associations, la formation et la recherche.

Le développement de nos pays appelle une promotion de nos ressources humaines grâce essentiellement, à la maîtrise de la science et de l'expertise, à l'exploitation rationnelle de nos ressources naturelles dont la gestion doit intégrer le respect de la nature et des écosystèmes qui constituent l'environnement de nos populations.

A ce propos, notre pays est décidé à prendre les mesures qu'il faut pour lever les obstacles qui s'opposent à un développement rapide de l'effort national en matière de recherche et donner une impulsion, qualitativement nouvelle, à la recherche scientifique et technique et à la recherche-développement dans toutes leurs dimensions, dans le cadre des orientations de Sa Majesté le Roi Mohammed VI, puisse Dieu Le préserver et Le combler en la personne de SAR le Prince Moulay Rachid et de l'ensemble de la Famille Royale.

Je souhaite le plein succès à vos travaux et un agréable séjour aux participants étrangers dans notre pays.

Je vous remercie de votre attention.

Address by
S. Vallerga, the Chairperson of the MedGOOS

Honourable Ministers, Ladies and Gentlemen,

It is a great pleasure for us to be in Rabat for this very important MedGOOS meeting which marks the first-time highlight of MedGOOS in a North African country. This meeting is also special because we have succeeded to bring together representatives of marine-related organisations from practically all the Mediterranean countries to share experiences and plan together the establishment of ocean observation and forecasting in the region. The value of this meeting thus reaches beyond its scientific content and prepares the way for the future trans-boundary platform that we need to build for MedGOOS.

The MedGOOS is an informal association founded in 1997 under the auspices of the UNESCO/Intergovernmental Oceanographic Commission (IOC) to provide a concerted approach to the planning and implementation of the Global Ocean Observing System (GOOS) in the Mediterranean. The MedGOOS aims at facilitating the development of an operational forecasting system at a regional to coastal scale to the benefit of a wide group of users in the region. In these initial stages, the MedGOOS is in the process of identifying the regional priorities for operational ocean forecasting and marine meteorology, assessing the related economic and social implications, and guiding and assisting the riparian states to the harmonious implementation of the Mediterranean ocean observing and forecasting system built on existing elements and based on principles of co-development, co-ownership and sharing of benefits. The MedGOOS will ensure the upgrading of national systems to the same level of expertise and infra-structure and will stimulate the necessary pre-operational R&D to ensure that GOOS is fully effective when it is eventually established, hopefully in ten to twenty years time.

The MedGOOS Association was formally established on the 12th of March 1999 in Rome at a special session during the 2nd EuroGOOS Conference. The large number of institutions already members of the Association is an important benchmark for our achievements in the first two years of existence. The regional dimension of the Association is an enabling asset to the future projection

of MedGOOS into long-term commitments at governmental level. It is hoped that this workshop will be a stimulus to further broaden the Association.

The workshop is also intended to provide a forum to establish the MedGOOS strategy and to obtain consensus at a regional level. In the coming days we hope to make profit from this special forum of scientists and representatives of the institutions involved in operational oceanography in the Mediterranean to define priorities, and plan the way forward with integration of efforts and appropriate measures in favour of technology transfer, cooperation and capacity building elements to bring capacities in different countries to comparable levels.

The capacity building aspects are of utmost importance for the development of MedGOOS. These activities must include (i) the human resources development; (ii) the establishment of the institutional framework; (iii) the setting up of a co-ordinated operational ocean forecasting system on a regional scale and with national components. This Workshop will focus on raising the level of awareness in the region on the benefits of implementing MedGOOS, and on the linkages to the UNCLOS and the UNCED '92 follow-ups in the Mediterranean.

Another important target for MedGOOS is the creation of national awareness. This awareness campaign is essential. The linkage to the EU, the role of MedGOOS for stability in the Mediterranean, and for linking South to North is to be stressed. The awareness process should be based on concrete actions. It is thus essential to accompany the first steps of MedGOOS by demonstration pilot projects, with the participation of MedGOOS member institutions from the South, that can provide a convincing success application as an example of the benefits and usefulness of MedGOOS.

The goals that we have set to achieve are far reaching. The vision is for the improvement of living standards in all the riparian countries. In our voyage to success we need to feel the thrust of all that are concerned and this workshop will show us the way and the benefits of achieving and sharing together.

Address by
Dr. Colin Summerhayes,
Director of the GOOS Project Office, IOC/UNESCO

On behalf of the Executive Secretary of the Intergovernmental Oceanographic Commission (IOC/UNESCO) Patricio Bernal, who is in Bonn, I would like to welcome you to the first MedGOOS workshop on Benefits of the Implementation of the Global Ocean Observing System in the Mediterranean Region.

It is very pleasing to see the Mediterranean community coming together to develop and implement a Mediterranean component of GOOS. The first MedGOOS meeting in Malta in November 1997 was a turning point in that development and further impetus came with the signing of the MedGOOS Memorandum of Understanding in Rome in March this year.

It is also good to see MedGOOS moving forward as one entity within orbit of GOOS-AFRICA and as follow up to the Pan-African Conference of Sustainable Integrated Coastal Management (PACSICOM) held in Maputo in July 1998. The IOC's involvement is fully consistent with UNESCO's intention to give high priority to Africa.

I am sure that the best way forward in the development of GOOS for the benefit of all nations is through partnerships especially regional ones, in which neighbours with common interests can devise and operate shared observational and forecasting systems for mutual benefit. This is how the WMO's World Weather Watch works, and we should apply the lessons learned there to the ocean world.

We are talking about the development of operational oceanography, which is the ability routinely to determine for all users, the present state of the sea, and to forecast its future state on hourly, daily, monthly, seasonal and annual time scales.

The present information will help sailors, fishermen and offshore industry, the future forecasts will help them and coastal planners. The climate forecasts will help farmers, foresters and those planning supplies of water and energy.

To take your efforts forward you will need to develop a strategy that is focussed and plans for projects as well as proposals to fund them. That is the goal of your workshop and I wish you great success with it.

I am impressed with the range of countries represented, and the enthusiasm you share. Looking ahead I expect to see you developing many partnerships to strengthen your development – not least with the UNEP Mediterranean Action Plan to meet the needs of the Barcelona Convention. We should not forget that UNEP is one of the sponsors of GOOS.

I am sure you will get help from EuroGOOS and from the European Commission which is already supporting the Mediterranean Forecasting System Pilot Project (MFSPP).

Before closing I would like to offer sincere thanks to our generous host, the Government of Morocco. It is a pleasure to sample the delights of the charming city of Rabat, and to be beside the sea while we discuss the ocean.

I would like to thank Professor Maria Snoussi and the local organizing team who have worked hard to enable us to take things forward. I would also like to thank the International Organizing Committee, especially Silvana Vallerga and Aldo Drago for their efforts in bringing you all together, and my colleague Justin Ahanhanzo, for his long hours at the computer keyboard composing emails and letters and bringing in the money to enable us all to be here.

Finally, we could not do this at all without the help of generous sponsors. In particular, I should like to thank the Governments of Morocco, Holland, France and Sweden, the United Nations Environment Programme (UNEP), the World Meteorological Organisation (WMO), the International Ocean Institute (IOI), the United Kingdom Meteorological Office, the United States' Office of Naval Research (ONR) and the Osservatorio Geofisico Sperimentale (OGS) from Italy.

ANNEX V

ACRONYMS

CAOS	Co-ordinated Adriatic Observing System
COP	Conference of the Parties
DBCP	Data Buoy Co-operation Panel
DNA	Designated National Agency
EU	European Union
GEF	Global Environment Facility
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
HOTO	Health of the Oceans
ICSU	International Council for Science
IGOSS	Integrated Global Ocean Services System
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IODE	International Oceanographic Data and Information Exchange
IOI	International Ocean Institute
IOS	Initial Observing System
IUCN	World Conservation Union
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
MAP	Mediterranean Action Plan
MAST	Marine Science and Technology Programme
MEDAR-MEDATLAS	Mediterranean Data Archaeology and Concerted Action
MEDPOL	Co-ordinated Mediterranean Pollution Monitoring and Research Programme
MFSPP	Mediterranean Forecasting System Pilot Project
MOU	Memorandum of Understanding
MTP	Mediterranean Targeted Project
NODC	National Oceanographic Data Centre
OGCM	Ocean General Circulation Model
OGS	Osservatorio Geofisico Sperimentale (Italy)
PACSICOM	Pan-African Conference on Sustainable Integrated Coastal Management (Maputo, Mozambique, 18 – 25 July 1998)
PIRATA	Pilot Research Array of Buoys in the Tropical Atlantic
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SIDA	Swedish International Development Agency
TAO	Tropical Atmosphere Ocean Array of Buoys in the Equatorial Pacific
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
US-ONR	Office of Naval Research (USA)
VOS	Voluntary Observing Ship
WMO	World Meteorological Organization
XBT	Expendable Bathythermograph

IOC Workshop Reports

The Scientific Workshops of the Intergovernmental Oceanographic Commission are sometimes jointly sponsored with other intergovernmental or non-governmental bodies. In most cases, IOC assures responsibility for printing, and copies may be requested from:

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No.	Title	Languages
1	CCOP-IOC, 1974, Metallogenesis, Hydrocarbons and Tectonic Patterns in Eastern Asia (Report of the IDOE Workshop on); Bangkok, Thailand, 24-29 September 1973 UNDP (CCOP),	E (out of stock)
2	CICAR Ichthyoplankton Workshop, Mexico City, 16-27 July 1974 (UNESCO Technical Paper in Marine Sciences, No. 20).	E (out of stock) S (out of stock)
3	Report of the IOC/GFCM/ICSEM International Workshop on Marine Pollution in the Mediterranean; Monte Carlo, 9-14 September 1974.	E,F E (out of stock)
4	Report of the Workshop on the Phenomenon known as 'El Niño'; Guayaquil, Ecuador, 4-12 December 1974.	E (out of stock) S (out of stock)
5	IDOE International Workshop on Marine Geology and Geophysics of the Caribbean Region and its Resources; Kingston, Jamaica, 17-22 February 1975	E (out of stock) S
6	Report of the CCOP/SOPAC-IOC IDOE International Workshop on Geology, Mineral Resources and Geophysics of the South Pacific; Suva, Fiji, 1-6 September 1975.	E
7	Report of the Scientific Workshop to Initiate Planning for a Co-operative Investigation in the North and Central Western Indian Ocean, organized within the IDOE under the sponsorship of IOC/FAO (IOFC)/UNESCO/ EAC; Nairobi, Kenya, 25 March-2 April 1976.	E, F,S, R
8	Joint IOC/FAO (IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters; Penang, 7-13 April 1976	E (out of stock)
9	IOC/CMG/SCOR Second International Workshop on Marine Geoscience; Mauritius 9-13 August 1976.	E, F, S, R
10	IOC/WMO Second Workshop on Marine Pollution (Petroleum) Monitoring; Monaco, 14-18 June 1976	E, F E (out of stock) R
11	Report of the IOC/FAO/UNEP International Workshop on Marine Pollution in the Caribbean and Adjacent Regions; Port of Spain, Trinidad, 13-17 December 1976.	E, S (out of stock)
11 Suppl.	Collected contributions of invited lecturers and authors to the IOC/FAO/UNEP International Workshop on Marine Pollution in the Caribbean and Adjacent Regions; Port of Spain, Trinidad, 13-17 December 1976	E (out of stock), S
12	Report of the IOCARIBE Interdisciplinary Workshop on Scientific Programmes in Support of Fisheries Projects; Fort-de-France, Martinique, 28 November-2 December 1977.	E, F, S
13	Report of the IOCARIBE Workshop on Environmental Geology of the Caribbean Coastal Area; Port of Spain, Trinidad, 16-18 January 1978.	E, S
14	IOC/FAO/WHO/UNEP International Workshop on Marine Pollution in the Gulf of Guinea and Adjacent Areas; Abidjan, Côte d'Ivoire, 2-9 May 1978	E, F
15	CPPS/FAO/IOC/UNEP International Workshop on Marine Pollution in the South-East Pacific; Santiago de Chile, 6-10 November 1978.	E (out of stock)
16	Workshop on the Western Pacific, Tokyo, 19-20 February 1979.	E, F, R
17	Joint IOC/WMO Workshop on Oceanographic Products and the IGOSS Data Processing and Services System (IDPSS); Moscow, 9-11 April 1979.	E
17 suppl.	Papers submitted to the Joint IOC/WMO Seminar on Oceanographic Products and the IGOSS Data Processing and Services System; Moscow, 2-6 April 1979.	E
18	IOC/UNESCO Workshop on Syllabus for Training Marine Technicians; Miami, U.S.A., 22-26 May 1978 (UNESCO reports in marine sciences, No. 4 published by the Division of Marine Sciences, UNESCO).	E (out of stock), F, S (out of tock), R
19	IOC Workshop on Marine Science Syllabus for Secondary Schools; Llantwit Major, Wales, U.K., 5-9 June 1978 (UNESCO reports in marine sciences, No. 5, published by the Division of Marine Sciences, UNESCO).	E (out of stock), S, R, Ar
20	Second CCOP-IOC Workshop on IDOE Studies of East Asia Tectonics and Resources; Bandung, Indonesia, 17-21 October 1978	E
21	Second IDOE Symposium on Turbulence in the Ocean; Liège, Belgium, 7-18 May 1979.	E, F, S, R
22	Third IOC/WMO Workshop on Marine Pollution Monitoring; New Delhi, 11-15 February 1980.	E, F, S, R
23	WESTPAC Workshop on the Marine Geology and Geophysics of the North-West Pacific; Tokyo, 27-31 March 1980.	E, R
24	WESTPAC Workshop on Coastal Transport of Pollutants; Tokyo, Japan, 27-31 March 1980.	E (out of stock)
25	Workshop on the Inter-calibration of Sampling Procedures of the IOC/ WMO UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open-Ocean Waters; Bermuda, 11-26 January 1980.	E (Superseded by IOC Technical Series No.22)
26	IOC Workshop on Coastal Area Management in the Caribbean Region; Mexico City, 24 September- 5 October 1979.	E, S
27	CCOP/SOPAC-IOC Second International Workshop on Geology, Mineral Resources and Geophysics of the South Pacific; Nouméa, New Caledonia, 9-15 October 1980.	E
28	FAO/IOC Workshop on the effects of environmental variation on the survival of larval pelagic fishes. Lima, 20 April-5 May 1980.	E
29	WESTPAC Workshop on Marine Biological Methodology; Tokyo, 9-14 February 1981.	E
30	International Workshop on Marine Pollution in the South-West Atlantic; Montevideo, 10-14 November 1980.	E (out of stock) S
31	Third International Workshop on Marine Geoscience; Heidelberg, 19-24 July 1982.	E, F, S
32	UNU/IOC/UNESCO Workshop on International Co-operation in the Development of Marine Science and the Transfer of Technology in the context of the New Ocean Regime; Paris, France, 27 September-1 October 1982.	E, F, S
32 Suppl.	Papers submitted to the UNU/IOC/ UNESCO Workshop on International Co-operation in the Development of Marine Science and the Transfer of Technology in the Context of the New Ocean Regime; Paris, France, 27 September-1 October 1982.	E
33	Workshop on the IREP Component of the IOC Programme on Ocean Science in Relation to Living Resources (OSLR); Halifax, 26-30 September 1963.	E
34	IOC Workshop on Regional Co-operation in Marine Science in the Central Eastern Atlantic (Western Africa); Tenerife, 12-17 December 1963.	E, F, S
35	CCOP/SOPAC-IOC-UNU Workshop on Basic Geo-scientific Marine Research Required for Assessment of Minerals and Hydrocarbons in the South Pacific; Suva, Fiji, 3-7 October 1983.	E
36	IOC/FAO Workshop on the Improved Uses of Research Vessels; Lisbon, Portugal, 28 May-2 June 1984.	E
36 Suppl.	Papers submitted to the IOC/FAO Workshop on the Improved Uses of Research Vessels; Lisbon, 28 May-2 June 1984	E
37	IOC/UNESCO Workshop on Regional Co-operation in Marine Science in the Central Indian Ocean and Adjacent Seas and Gulfs; Colombo, 8-13 July 1985.	E
38	IOC/ROPME/UNEP Symposium on Fate and Fluxes of Oil Pollutants in the Kuwait Action Plan Region; Basrah, Iraq, 8-12 January 1984.	E
39	CCOP (SOPAC)-IOC-IFREMER-ORSTOM Workshop on the Uses of Submersibles and Remotely Operated Vehicles in the South Pacific; Suva, Fiji, 24-29 September 1985.	E
40	IOC Workshop on the Technical Aspects of Tsunami Analysis, Prediction and Communications; Sidney, B.C., Canada, 29-31 July 1985.	E
40 Suppl.	First International Tsunami Workshop on Tsunami Analysis, Prediction and Communications, Submitted Papers; Sidney, B.C., Canada, 29 July-1 August 1985.	E
41	First Workshop of Participants in the Joint FAO/IOC/WHO/IAEA/UNEP Project on Monitoring of Pollution in the Marine Environment of the West and Central African Region (WACAF/2); Dakar, Senegal, 28 October-1 November 1985.	E
43	IOC Workshop on the Results of MEDALPEX and Future Oceanographic Programmes in the Western Mediterranean; Venice, Italy, 23-25 October 1985.	E
44	IOC-FAO Workshop on Recruitment in Tropical Coastal Demersal Communities; Ciudad del Carmen, Campeche, Mexico, 21-25 April 1986.	E (out of stock) S
44 Suppl.	IOC-FAO Workshop on Recruitment in Tropical Coastal Demersal Communities, Submitted Papers; Ciudad del Carmen, Campeche, Mexico, 21-25 April 1986.	E
45	IOCARIBE Workshop on Physical Oceanography and Climate; Cartagena, Colombia, 19-22 August 1986.	E
46	Reunión de Trabajo para Desarrollo del Programa "Ciencia Oceánica en Relación a los Recursos No Vivos en la Región del Atlántico Sud-occidental"; Porto Alegre, Brasil, 7-11 de abril de 1986.	S
47	IOC Symposium on Marine Science in the Western Pacific: The Indo-Pacific Convergence; Townsville, 1-6 December 1966	E
48	IOCARIBE Mini-Symposium for the Regional Development of the IOC-UN (OETB) Programme on 'Ocean Science in Relation to Non-Living Resources (OSNLR)'; Havana, Cuba, 4-7 December 1986.	E, S
49	AGU-IOC-WMO-CPPS Chapman Conference: An International Symposium on 'El Niño'; Guayaquil, Ecuador, 27-31 October 1986.	E
50	CCALR-IOC Scientific Seminar on Antarctic Ocean Variability and its Influence on Marine Living Resources, particularly Krill (organized in collaboration with SCAR and SCOR); Paris, France, 2-6 June 1987.	E
51	CCOP/SOPAC-IOC Workshop on Coastal Processes in the South Pacific Island Nations; Lae, Papua-New Guinea, 1-8 October 1987.	E
52	SCOR-IOC-UNESCO Symposium on Vertical Motion in the Equatorial Upper Ocean and its Effects upon Living Resources and the Atmosphere; Paris, France, 6-10 May 1985.	E
53	IOC Workshop on the Biological Effects of Pollutants; Oslo, 11-29 August 1986.	E
54	Workshop on Sea-Level Measurements in Hostile Conditions; Bidston, UK, 28-31 March 1988.	E
55	IBCCA Workshop on Data Sources and Compilation, Boulder, Colorado, 18-19 July 1988.	E
56	IOC-FAO Workshop on Recruitment of Penaeid Prawns in the Indo-West Pacific Region (PREP); Cleveland, Australia, 24-30 July 1988.	E
57	IOC Workshop on International Co-operation in the Study of Red Tides and Ocean Blooms; Takamatsu, Japan, 16-17 November 1987.	E

No.	Title	Languages
58	International Workshop on the Technical Aspects of the Tsunami Warning System; Novosibirsk, USSR, 4-5 August 1989.	E
58 Suppl.	Second International Workshop on the Technical Aspects of Tsunami Warning Systems, Tsunami Analysis, Preparedness, Observation and Instrumentation. Submitted Papers; Novosibirsk, USSR, 4-5 August 1989.	E
59	IOC-UNEP Regional Workshop to Review Priorities for Marine Pollution Monitoring Research, Control and Abatement in the Wider Caribbean; San José, Costa Rica, 24-30 August 1989.	E, F, S
60	IOC Workshop to Define IOCARIBE-TRODERP proposals; Caracas, Venezuela, 12-16 September 1989.	E
61	Second IOC Workshop on the Biological Effects of Pollutants; Bermuda, 10 September-2 October 1988.	E
62	Second Workshop of Participants in the Joint FAO-IOC-WHO-IAEA-UNEP Project on Monitoring of Pollution in the Marine Environment of the West and Central African Region; Accra, Ghana, 13-17 June 1988.	E
63	IOC/WESTPAC Workshop on Co-operative Study of the Continental Shelf Circulation in the Western Pacific; Bangkok, Thailand, 31 October-3 November 1989.	E
64	Second IOC-FAO Workshop on Recruitment of Penaeid Prawns in the Indo-West Pacific Region (PREP); Phuket, Thailand, 25-31 September 1989.	E
65	Second IOC Workshop on Sardine/Anchovy Recruitment Project (SARP) in the Southwest Atlantic; Montevideo, Uruguay, 21-23 August 1989.	E
66	IOC ad hoc Expert Consultation on Sardine/ Anchovy Recruitment Programme; La Jolla, California, U.S.A., 1989	E
67	Interdisciplinary Seminar on Research Problems in the IOCARIBE Region; Caracas, Venezuela, 28 November-1 December 1989.	E (out of stock)
68	International Workshop on Marine Acoustics; Beijing, China, 26-30 March 1990.	E
69	IOC-SCAR Workshop on Sea-Level Measurements in the Antarctica; Leningrad, USSR, 28-31 May 1990.	E
69 Suppl.	IOC-SCAR Workshop on Sea-Level Measurements in the Antarctica; Submitted Papers; Leningrad, USSR, 28-31 May 1990.	E
70	IOC-SAREC-UNEP-FAO-IAEA-WHO Workshop on Regional Aspects of Marine Pollution; Mauritius, 29 October - 9 November 1990.	E
71	IOC-FAO Workshop on the Identification of Penaeid Prawn Larvae and Postlarvae; Cleveland, Australia, 23-28 September 1990.	E
72	IOC/WESTPAC Scientific Steering Group Meeting on Co-Operative Study of the Continental Shelf Circulation in the Western Pacific; Kuala Lumpur, Malaysia, 9-11 October 1990.	E
73	Expert Consultation for the IOC Programme on Coastal Ocean Advanced Science and Technology Study; Liège, Belgium, 11-13 May 1991.	E
74	IOC-UNEP Review Meeting on Oceanographic Processes of Transport and Distribution of Pollutants in the Sea; Zagreb, Yugoslavia, 15-18 May 1989.	E
75	IOC-SCOR Workshop on Global Ocean Ecosystem Dynamics; Solomons, Maryland, U.S.A., 29 April-2 May 1991.	E
76	IOC/WESTPAC Scientific Symposium on Marine Science and Management of Marine Areas of the Western Pacific; Penang, Malaysia, 2-6 December 1991.	E
77	IOC-SAREC-KMFRI Regional Workshop on Causes and Consequences of Sea-Level Changes on the Western Indian Ocean Coasts and Islands; Mombasa, Kenya, 24-28 June 1991.	E
78	IOC-CEC-ICES-WMO-ICSU Ocean Climate Data Workshop Goddard Space Flight Center; Greenbelt, Maryland, U.S.A., 18-21 February 1992.	E
79	IOC/WESTPAC Workshop on River Inputs of Nutrients to the Marine Environment in the WESTPAC Region; Penang, Malaysia, 26-29 November 1991.	E
80	IOC-SCOR Workshop on Programme Development for	E
	Harmful Algae Blooms; Newport, U.S.A. 2-3 November 1991.	
81	Joint IAPSO-IOC Workshop on Sea Level Measurements and Quality Control; Paris, France, 12-13 October 1992.	E
82	BORDOMER 92: International Convention on Rational Use of Coastal Zones. A Preparatory Meeting for the Organization of an International Conference on Coastal Change; Bordeaux, France, 30 September-2 October 1992.	E
83	IOC Workshop on Donor Collaboration in the Development of Marine Scientific Research Capabilities in the Western Indian Ocean Region; Brussels, Belgium, 12-13 October 1992.	E
84	Workshop on Atlantic Ocean Climate Variability; Moscow, Russian Federation, 13-17 July 1992	E
85	IOC Workshop on Coastal Oceanography in Relation to Integrated Coastal Zone Management; Kona, Hawaii, 1-5 June 1992.	E
86	International Workshop on the Black Sea; Varna, Bulgaria, 30 September – 4 October 1991	E
87	Taller de trabajo sobre efectos biológicos del fenómeno «El Niño» en ecosistemas costeros del Pacífico Sudeste; Santa Cruz, Galápagos, Ecuador, 5-14 de octubre de 1989.	S only (summary in E, F, S)
88	IOC-CEC-ICSU-ICES Regional Workshop for Member States of Eastern and Northern Europe (GODAR Project); Obninsk, Russia, 17-20 May 1993.	E
89	IOC-ICSEM Workshop on Ocean Sciences in Non-Living Resources; Perpignan, France, 15-20 October 1990.	E
90	IOC Seminar on Integrated Coastal Management; New Orleans, U.S.A., 17-18 July 1993.	E
91	Hydroblack'91 CTD Intercalibration Workshop; Woods Hole, U.S.A., 1-10 December 1991.	E
92	Réunion de travail IOCEA-OSNLR sur le Projet « Budgets sédimentaires le long de la côte occidentale d'Afrique » Abidjan, côte d'Ivoire, 26-28 juin 1991.	E
93	IOC-UNEP Workshop on Impacts of Sea-Level Rise due to Global Warming. Dhaka, Bangladesh, 16-19 November 1992.	E
94	BMTC-IOC-POLARMAR International Workshop on Training Requirements in the Field of Eutrophication in Semi-enclosed Seas and Harmful Algal Blooms, Bremerhaven, Germany, 29 September-3 October 1992.	E
95	SAREC-IOC Workshop on Donor Collaboration in the Development of Marine Scientific Research Capabilities in the Western Indian Ocean Region; Brussels, Belgium, 23-25 November 1993.	E
96	IOC-UNEP-WMO-SAREC Planning Workshop on an Integrated Approach to Coastal Erosion, Sea Level Changes and their Impacts; Zanzibar, United Republic of Tanzania, 17-21 January 1994.	E
96 Suppl.	IOC-UNEP-WMO-SAREC Planning Workshop on an Integrated Approach to Coastal Erosion, Sea Level Changes and their Impacts; Submitted Papers 1. Coastal Erosion; Zanzibar, United Republic of Tanzania 17-21 January 1994.	E
96 Suppl	IOC-UNEP-WMO-SAREC Planning Workshop on an Integrated Approach to Coastal Erosion, Sea Level Changes and their Impacts; Submitted Papers 2. Sea Level; Zanzibar, United Republic of Tanzania 17-21 January 1994.	E
97	IOC Workshop on Small Island Oceanography in Relation to Sustainable Economic Development and Coastal Area Management of Small Island Development States; Fort-de-France, Martinique, 8-10 November, 1993.	E
98	CoMSBlack '92A Physical and Chemical Intercalibration Workshop; Erdemli, Turkey, 15-29 January 1993.	E
99	IOC-SAREC Field Study Exercise on Nutrients in Tropical Marine Waters; Mombasa, Kenya, 5-15 April 1994.	E
100	IOC-SOA-NOAA Regional	E
	Workshop for Member States of the Western Pacific - GODAR-II (Global Oceanographic Data Archeology and Rescue Project); Tianjin, China, 8-11 March 1994.	
101	IOC Regional Science Planning Workshop on Harmful Algal Blooms; Montevideo, Uruguay, 15-17 June 1994.	E
102	First IOC Workshop on Coastal Ocean Advanced Science and Technology Study (COASTS); Liège, Belgium, 5-9 May 1994.	E
103	IOC Workshop on GIS Applications in the Coastal Zone Management of Small Island Developing States; Barbados, 20-22 April 1994.	E
104	Workshop on Integrated Coastal Management; Dartmouth, Canada, 19-20 September 1994.	E
105	BORDOMER 95: Conference on Coastal Change; Bordeaux, France, 6-10 February 1995.	E
105 Suppl.	Conference on Coastal Change: Proceedings; Bordeaux, France, 6-10 February 1995	E
106	IOC/WESTPAC Workshop on the Paleographic Map; Bali, Indonesia, 20-21 October 1994.	E
107	IOC-ICSU-NIO-NOAA Regional Workshop for Member States of the Indian Ocean - GODAR-III; Dona Paula, Goa, India, 6-9 December 1994.	E
108	UNESCO-IHP-IOC-IAEA Workshop on Sea-Level Rise and the Multidisciplinary Studies of Environmental Processes in the Caspian Sea Region; Paris, France, 9-12 May 1995.	E
108 Suppl.	UNESCO-IHP-IOC-IAEA Workshop on Sea-Level Rise and the Multidisciplinary Studies of Environmental Processes in the Caspian Sea Region; Submitted Papers; Paris, France, 9-12 May 1995.	E
109	First IOC-UNEP CEPPOL Symposium; San José, Costa Rica, 14-15 April 1993.	E
110	IOC-ICSU-CEC regional Workshop for Member States of the Mediterranean - GODAR-IV (Global Oceanographic Data Archeology and Rescue Project) Foundation for International Studies, University of Malta, Valletta, Malta, 25-28 April 1995.	E
111	Chapman Conference on the Circulation of the Intra-Americas Sea; La Parguera, Puerto Rico, 22-26 January 1995.	E
112	IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials (GESREM) Workshop; Miami, U.S.A., 7-8 December 1993.	E
113	IOC Regional Workshop on Marine Debris and Waste Management in the Gulf of Guinea; Lagos, Nigeria, 14-16 December 1994.	E
114	International Workshop on Integrated Coastal Zone Management (ICZM) Karachi, Pakistan; 10-14 October 1994.	E
115	IOC/GLOSS-IAPSO Workshop on Sea Level Variability and Southern Ocean Dynamics; Bordeaux, France, 31 January 1995	E
116	IOC/WESTPAC International Scientific Symposium on Sustainability of Marine Environment: Review of the WESTPAC Programme, with Particular Reference to ICAM, Bali, Indonesia, 22-26 November 1994.	E
117	Joint IOC-CIDA-Sida (SAREC) Workshop on the Benefits of Improved Relationships between International Development Agencies, the IOC and other Multilateral Inter-governmental Organizations in the Delivery of Ocean, Marine Affairs and Fisheries Programmes; Sidney B.C., Canada, 26-28 September 1995.	E
118	IOC-UNEP-NOAA-Sea Grant Fourth Caribbean Marine Debris Workshop; La Romana, Santo Domingo, 21-24 August 1995.	E
119	IOC Workshop on Ocean Colour Data Requirements and Utilization; Sydney B.C., Canada, 21-22 September 1995.	E
120	International Training Workshop on Integrated Coastal Management; Tampa, Florida, U.S.A., 15-17 July 1995.	E
121	IOC-EU-BSH-NOAA-(WDC-A)	E

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	International Workshop on Oceanographic Biological and Chemical Data Management, Hamburg, Germany, 20-23 May 1996.	
122	IOC-EU-BSH-NOAA-(WDC-A) International Workshop on Oceanographic Biological and Chemical Data Management, Hamburg, Germany, 20-23 May 1996.	E
123	Second IOC Regional Science Planning Workshop on Harmful Algal Blooms in South America; Mar del Plata, Argentina, 30 October - 1 November 1995.	E, S
124	GLOBEC-IOC-SAHFOS-MBA Workshop on the Analysis of Time Series with Particular Reference to the Continuous Plankton Recorder Survey; Plymouth, U.K.,4-7 May 1993.	E
125	Atelier sous-régional de la COI sur les ressources marines vivantes du Golfe de Guinée ; Cotonou, Bénin, 1-4 juillet 1996.	E
126	IOC-UNEP-PERSGA-ACOPS-IUCN Workshop on Oceanographic Input to Integrated Coastal Zone Management in the Red Sea and Gulf of Aden. Jeddah, Saudi Arabia, 8 October 1995.	E
127	IOC Regional Workshop for Member States of the Caribbean and South America GODAR-V (Global Oceanographic Data Archeology and Rescue Project); Cartagena de Indias, Colombia, 8-11 October 1996.	E
128	Atelier IOC-Banque Mondiale-Sida/SAREC-ONE sur la Gestion Intégrée des Zones Côtières ; Nosy Bé, Madagascar, 14-18 octobre 1996.	E
129	Gas and Fluids in Marine Sediments, Amsterdam, the Netherlands; 27-29 January 1997.	E
130	Atelier régional de la COI sur l'océanographie côtière et la gestion de la zone côtière ;Moroni, RFI des Comores, 16-19 décembre 1996.	E
131	GOOS Coastal Module Planning Workshop; Miami, USA, 24-28 February 1997	E
132	Third IOC-FANSA Workshop; Punta-Arenas, Chile, 28-30 July 1997	S/E
133	Joint IOC-CIESM Training Workshop on Sea-level Observations and Analysis for the Countries of the Mediterranean and Black Seas; Birkenhead, U.K., 16-27 June 1997.	E
134	IOC/WESTPAC-CCOP Workshop on Paleogeographic Mapping (Holocene Optimum); Shanghai, China, 27-29 May 1997.	E
135	Regional Workshop on Integrated Coastal Zone Management; Chabahar, Iran; February 1996.	E
136	IOC Regional Workshop for Member States of Western Africa (GODAR-VI); Accra, Ghana, 22-25 April 1997.	E
137	GOOS Planning Workshop for Living Marine Resources, Dartmouth, USA; 1-5 March 1996.	E
138	Gestión de Sistemas Oceanográficos del Pacífico Oriental; Concepción, Chile, 9-16 de abril de 1996.	S
139	Sistemas Oceanográficos del Atlántico Sudoccidental, Taller, TEMA;Furg, Rio Grande, Brasil, 3-11 de noviembre de 1997	S
140	IOC Workshop on GOOS Capacity Building for the Mediterranean Region; Valletta, Malta, 26-29 November 1997.	E
141	IOC/WESTPAC Workshop on Co-operative Study in the Gulf of Thailand: A Science Plan; Bangkok, Thailand, 25-28 February 1997.	E
142	Pelagic Biogeography ICoPB II. Proceedings of the 2nd International Conference. Final Report of SCOR/IOC Working Group 93; Noordwijkerhout, The Netherlands, 9-14 July 1995.	E
143	Geosphere-biosphere coupling: Carbonate Mud Mounds and Cold Water Reefs; Gent, Belgium, 7–11 February 1998.	E
144	IOC-SOPAC Workshop Report on Pacific Regional Global Ocean Observing Systems; Suva, Fiji, 13-17 February 1998.	E
145	IOC-Black Sea Regional Committee Workshop: 'Black Sea Fluxes' Istanbul, Turkey, 10-12 June 1997.	E
146	Living Marine Resources Panel Meeting, Paris, France, 23-25 March 1998.	E
147	IOC-SOA International Training Workshop on the Intregration of Marine Sciences into the Process of Integrated Coastal Management, Dalian, China, 19-24 May 1997.	E
148	IOC/WESTPAC International Scientific Symposium – Role of Ocean Sciences for Sustainable Development Okinawa, Japan, 2-7 February 1998.	E
149	Workshops on Marine Debris & Waste Management in the Gulf of Guinea, 1995-97.	E
150	First IOCARIBE-ANCA Workshop Havana, Cuba, 29 June-1 July 1998.	E
151	Taller Pluridisciplinario TEMA sobre Redes del Gran Caribe en Gestión Integrada de Áreas Costeras Cartagena de Indias, Colombia, 7-12 de septiembre de 1998.	S
152	Workshop on Data for Sustainable Integrated Coastal Management (SICOM) Maputo, Mozambique, 18-22 July 1998	E
153	IOC/WESTPAC-Sida (SAREC) Workshop on Atmospheric Inputs of Pollutants to the Marine Environment Qingdao, China, 24-26 June 1998	E
154	IOC-Sida-Flanders-SFRI Workshop on Ocean Data Management in the IOCINCWIO Region (ODINEA project) Capetown, South Africa, 30 November-11 December 1998.	E
155	Science of the Mediterranean Sea and its applications UNESCO, Paris 29-31 July 1997	E
156	IOC-LUC-KMFRI Workshop on RECOSCIX-WIO in the Year 2000 and Beyond, Mombasa, Kenya, 12-16 April 1999	E
157	'98 IOC-KMI International Workshop on Integrated Coastal Management (ICM), Seoul, Republic of Korea 16-18 April 1998	E
158	The IOCARIBE Users and the Global Ocean Observing System (GOOS) Capacity Building Workshop, San José, Costa Rica, 22-24 April 1999	E
159	Oceanic Fronts and Related Phenomena (Konstantin Federov Memorial Symposium) – Proceedings, Pushkin, Russian Federation, 18-22 May 1998	E
160	Under preparation	
161	Under preparation	
162	Workshop report on the Transports and Linkages of the Intra-americas Sea (IAS), Cozumel, Mexico, 1-5 November 1997	E
163	Under preparation	
164	IOC-Sida-Flanders-MCM Third Workshop on Ocean Data Management in the IOCINCWIO Region (ODINEA Project), Cape Town, South Africa, 29 November – 11 December 1999	E
165	An African Conference on Sustainable Integrated Management; Proceedings of the Workshops. An Integrated Approach, (PACSICOM), Maputo, Mozambique, 18 –25 July 1998	E, F
166	IOC-SOA International Workshop on Coastal Megacities: Challenges of Growing Urbanization of the World's Coastal Areas; Hangzhou, P.R. China, 27 –30 September 1999	E
167	IOC-Flanders First ODINAFRICA-II Planning Workshop, Dakar, Senegal, 2-4 May 2000	E
168	Geological Processes on European Continental Margins; International Conference and Eight Post-cruise Meeting of the Training-Through-Research Programme, Granada, Spain, 31 January – 3 February 2000	E
169	International Conference on the International Oceanographic Data & Information Exchange in the Western Pacific (IODE-WESTPAC) 1999, ICIWP '99 Langkawi, Malaysia, 1-4 November 1999	***under preparation***
170	IOCARIBE-GODAR-I Cartagenas, Colombia, February 2000	***under preparation***
171	Ocean Circulation Science derived from the Atlantic, Indian and Arctic Sea Level Networks, Toulouse, France, 10-11 May 1999	E
172	(*Under preparation*)	
173	The Benefits of the Implementation of the GOOS in the Mediterranean Region, Rabat, Morocco, 1-3 November 1999	E, F

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