Intergovernmental Oceanographic Commission

Workshop Report No. 173

IOC Workshop on

THE BENEFITS OF THE IMPLEMENTATION OF THE GLOBAL OCEAN OBSERVING SYSTEM IN THE MEDITERRANEAN REGION

Rabat, Morocco

1-3 November 1999

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This workshop has been sponsored by: 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.

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Summary

The 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 organizations. 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 preparing project proposals to be submitted to potential donors and funding agencies. The Fifth Framework Programme of The European Union and the GEF of the World Bank were identified as potential sources of funds. The PACSICOM/African Process for the Development and Protection of the Coastal and Marine Environment was also identified as a funding source for North African countries.

The Workshop recognized that, while GOOS is a global programme, it is being developed at the regional level through programmes such as MedGOOS, EuroGOOS and GOOS-AFRICA, and built around and in support of local initiatives. The MedGOOS Strategy was presented to the Workshop participants and approved by the attendees. New countries signed the MedGOOS Memorandum of Understanding (MoU) and a number of others expressed the intention to do so in the near future.

Tribute is paid to the Local Organizing Committee under the Chairmanship of Dr. Maria Snoussi, who handled organizational matters. The Chairperson of MedGOOS, Dr. Silvana Vallerga, conducted the workshop with the assistance of Dr. Aldo Drago, the MedGOOS Secretary. Much of the success of the Workshop is due to the sponsors, including 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.

1. INTRODUCTION

The Workshop analysed the potential benefits deriving from the implementation of the Global Ocean Observing System for the Mediterranean (MedGOOS). The Workshop came two years after the first IOC workshop on GOOS Capacity Building for the Mediterranean region that took place in Malta, 26-27 November 1997. The intensive 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 North Africa, as well as from United Nations agencies and international governmental and non-governmental organizations. 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 the participation in MedGOOS to all the 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 the 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 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 (refer to Annex 5).

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 ocean forecasting 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 to the Workshop. The Secretary of State acknowledged the dedication of the Local and International Organising Committees as well as the efforts of the MedGOOS Secretariat.

The Director of the GOOS Project Office was then called upon to address opening remarks to the participants. Dr. Colin Summerhayes, on behalf of the IOC Executive Secretary, welcomed the participants and stressed the importance of working together in developing operational ocean forecasting in the Mediterranean. He recalled the various steps that led to the development of the MedGOOS initiative, starting from the Malta Workshop organised by the IOC in 1997, to the signing of the MedGOOS Memorandum of Understanding in Rome, in March 1999, between the Association of MedGOOS countries. He pointed out that MedGOOS is moving forward as a separate entity but in conjunction to GOOS-AFRICA which emerged as a follow up to the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM). 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 benefits. He highlighted the similarity between the World Meteorological Organisation's World Weather Watch programme and the GOOS Programme.

Stressing the importance of operational oceanography, which is the ability to routinely 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 scales, he highlighted the way in which this information will help sailors, fishermen and the offshore industry in particular.

The Chairperson of the MedGOOS, Dr. Silvana Vallerga, welcomed the participants and thanked the IOC Secretariat for its support in planning and organising the Workshop. She also thanked the host country and the Local and International Organising Committees. The Chairperson highlighted the need for the Mediterranean countries to join efforts towards establishing ocean forecasting. She recalled the progress made by the region in signing the MedGOOS Memorandum of Understanding and invited the participating countries to join the MedGOOS Association.

2. ADMINISTRATIVE ARRANGEMENTS

The Chairperson of the Local Organising Committee, Dr. 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 outline of proposal(s).

2.1 ADOPTION OF THE AGENDA

The provisional agenda (ANNEX IV) was adopted by the participants.

2.2 DESIGNATION OF THE RAPPORTEUR

The Technical Secretary of IOC/UNESCO, M. Justin Ahanhanzo, was appointed to serve as Rapporteur for the whole meeting. Dr. Aldo Drago, Secretary of the MedGOOS 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 need of the Framework Convention on Climate Change by underpinning forecasts of changes in climate. GOOS is not solely operational, said Dr. Summerhayes, 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 sub-systems 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. The managers of most of these systems, including a representative of the IOC's International Data and Information Exchange programme (IODE), are 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 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 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 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 at an early stage of development from the point of view of definitive publications. 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 three oceans, 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.

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 some objectives which are specialised to sub-regions, or to special social and economic conditions, and 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, while encouraging separate developments at sub-regional and local levels. Dr. Flemming ensured that EuroGOOS 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. The target is that of 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 achieve 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 initiate projects for capacity building. The science, technology and socio-economic bases of the MedGOOS will initially be approached together with the EuroGOOS, of 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, Chairman 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 concerned with 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

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 Mombassa, 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 searches, document delivery, and subscription to ASFA. The project produced a catalogue of holding 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 needs 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 on development of an Ocean Data and Information Network in Africa (ODINAFRICA).

3.6 CO-DEVELOPMENT OF TECHNICAL CAPACITIES FOR MEDGOOS

Dr. Stel started his presentation by setting the backgrounds for the implementation of both UNCED's programme of actions listed under "Agenda 21" and UNCLOS 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 on the fact that the funding for the capacity building activities is sought through national and international Official Development Aid (ODA) organizations 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 human resources at the level of individual scientist, the necessary institutions and an enabling national environment which is willing to support and sustain a marine research activity.

3.7 NAVAL OPERATIONAL OCEANOGRAPHY

Dr. R. Beach presented a paper on "Achieving Robust Operational METOC Forecasts by increasing Operational Evaluations". His talk provided insight into operational centers run by the US 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 Centers goals have considerable overlap with those in the civilian community: to provide real-time nowcasts and forecasts of the 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.

He stressed the fact that 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 Ocean and Atmospheric research. Access to these real-time products, said Dr. Beach, is granted on a case-by-case basis in exchange for evaluations of their performance.

Dr. Beach pointed out that the second process focuses on enabling feedback from operational customers. He informed the participants that there is a strong consensus to increase the number and quality of operational evaluations, and to collate and to share them in digital form. Dr. Beach referred to the Internet as an appropriate tool to provide a rich forum for collecting feedback via web-based evaluation forms designed for each model product.

Dr. Beach concluded that 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

- OPERATIONAL OCEANOGRAPHY IN THE FIFTH FRAMEWORK PROGRAMME OF THE EUROPEAN UNION

In his presentation, Dr. A. Edwards from the Directorate General of the European Commission, stressed the fact that operational oceanography is an important topic in the "Environment and Sustainable Development " thematic programme of the European Community's 5th Framework Programme (FP5). He pointed out that 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, Terrestrial and Oceans". The aim, said Dr. Edwards, is to facilitate safe, sustainable offshore operations within the given environmental constraints and to develop the necessary components of an appropriate marine observation system. He pointed out that in the FP5,

there are opportunities in the field of technological development, for example in developing communication, monitoring, surveying and imaging systems.

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

- EC MAST PROJECTS AND RESULTS IN THE MEDITERRANEAN SEA

Dr. E. Lipiatou from the Research Directorate General of the European Commission presented an overview on the MAST programmes. She reported that the European Commission under the MAST Programme 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. She informed the participants that many advanced courses and workshops were organised. Fellowships were granted to the European students to reinforce the research capacity in the participating countries. Dr. Lipiatou stressed the fact that as results of these projects, the European laboratories and universities built large-scale models explaining long term changes of the Mediterranean Sea. She underlined that these results would 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. She also pointed out that the results would 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 provided opportunities for cooperation with non-European Union neighbouring countries.

- CAOS- A PROPOSED REGIONAL ACTIVITY OF C-GOOS AND MEDGOOS

Dr. N. Smodlaka presented the topic on the Co-ordinated Adriatic Observing System (CAOS). He pointed out that 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 the Coastal module of the GOOS.

Dr. Smodlaka underlined that the Adriatic Sea exhibits manifestations of regional and global environmental problems that are amenable to sampling with new technologies. He informed the participants that the CAOS project was initiated in 1998 in order to develop sampling for core parameters compatible with the GOOS requirements and principles. Dr. Smodlaka said that 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 CGOOS and the MedGOOS. He stressed the fact that the long collaboration established between the three countries involved in research and monitoring of the Adriatic sea will help to obtain a needed political and financial support from the Members 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: THE FIRST PHASE OF IMPLEMENTATION (MFSPP)

Dr. N. Pinardi outlined the MFSPP project, which is in a phase of completion. She pointed out that the project consists of: 1) elements of a large-scale automatic observing system with near real time data release through Internet and GTS; 2) a modelling and data assimilation component which initialise basin wide weekly forecasts; 3) a coastal modelling downscaling component which uses the basin wide forecasts to initialise regional and shelf models; 4) an ecosystem modelling component for selected test site shelf areas; 5) an experimental user community which can access and use both the observations and nowcasting/forecasting information.

The MFSPP started in September 1999 its VOS-XBT data collection 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 and a system of drifting buoys, surface and subsurface.

On the other hand, ecosystem models are also being implemented in the context of the MFSPP and 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 THE DATA ARCHIVING FOR MedGOOS: THE MAST/MEDAR-MEDATLAS II MEDITERRANEAN DATA ARCHAEOLOGY AND CONCERTED ACTION (MAS3-CT98-0174/IC20-CT98-0103)

Dr. C. Maillard provided 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 gathers 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 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 the scientific newsletter 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

Dr. D. Rosen presented this topic. The IOC and the Commission Internationale pour l'Exploration Scientifique de la Mer Mediterranée (CIESM), have agreed in 1996 to jointly cooperate in the study of sea level by establishing a long term monitoring network system for systematic sea-level measurements in the Mediterranean and Black Seas. 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, aimed to provide high-quality standardized data, which can then be directly applied for the various regional and worldwide studies.

A preliminary expert workshop on MedGLOOS was held jointly by CIESM and IOC at CIESM Headquarters in Monaco in February 1996. In the Summer of 1996 a Memorandum of Understanding was signed between IOC and CIESM, 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 GPS missions and absolute gravimetry at all selected sites, of which a limited number were planned to become permanent GPS stations. The sea level 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.

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

Dr. 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. Dr. Civili informed the participants that MED POL is implemented as the 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) marine pollution national 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). Dr. Civili underlined the fact that the new phase of MED POL shifts emphasis of monitoring from pollution assessment to pollution reduction and control. In fact, 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 control on Land Bases Sources and Activities (LBS Protocol). The Programme then comes 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 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 have been published in the Abstract book of the workshop. Requests should be addressed to the Chairperson of the Local Organising Committee, Dr. M. Snoussi (see, the address in the related annex).

6. WORKING GROUPS

Under the leadership of the Chairperson, Dr. S. Vallerga the participants split up into three working groups. The objective of working group (1), on networking for sharing resources, chaired by Catherine Maillard (IFREMER, France) was to identify mechanisms for reinforcing co-operation amongst the Mediterranean research institutions. Working group (2), on capacity building was chaired by Silvana 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. The working group (3), chaired by Cristos Tziavos (NCMR, Greece), 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 as coherent directions and project proposals for the design and implementation of MedGOOS.

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 acquisition, and processing;
- Real time data integration and their circulation within the MedGOOS system;
- Communication: especially in relation to dissemination of information and data products to end-users.

Identification of what is needed to achieve the above:

- Infrastructures: Concept of the NODC/DNA as focal points following the IOC/IODE Programme for delayed mode data;
- Nature of the data: Basic data: physical oceanographic and meteorological data plus biochemical and pollution data;
- Technological support: primarily coastal monitoring systems (e-mail, www);
- Computational means (for modelling and archival);
- Data management software (cataloguing, formatting, processing, visualisation);
- Products: common catalogues, common basic data sets, applications to coastal zone;
- Exchange of model data/products;
- Human expertise: qualification for data management, for marine technicians, for monitoring systems.

Working Group -2: Capacity building

The group assessed the present situation with respect to 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 in the Mediterranean countries.

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) exchange of personnel

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

Working Group -3: Consolidation of observing systems:

The group pointed out that there is a need to assess existing monitoring systems according to their present capabilities in terms of location, time of operation and implementation scale: short/medium and long term. The group reviewed the existing systems that are already operational in the region, including projected proposals for Mediterranean monitoring buoys network. It was recommended to widen these projects to all interested Mediterranean countries.

Plenary Session

During the plenary discussions, the question on the MedGOOS data exchange policy was addressed. The question was asked whether MedGOOS will opt for total liberalisation of data exchange policy, 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, Dr. S. Vallerga to put the work packages of the working groups in the format of the project proposals to be submitted in the context of the Fifth Framework of the European Community Programme in the year 2000.

8. RECOMMENDATIONS

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 on coastal 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 a full support to the MedGOOS programmes and initiatives.

9. CLOSURE

The Secretary of State for Scientific Research, the Chairperson of the MedGOOS and the Director of the GOOS Project Office made the closing remarks, in which they all emphasised the need for Co-operation in the region to develop observing systems for common interests. 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 the MedGOOS projects. The Chairperson also thanked the IOC/UNESCO for its support in organising the workshop and encouraged the MedGOOS countries to provide the requested support for the developments of the project proposals. She also thanked the Local Organising Committee for the facilities and services provided during the workshop. The Director of the MedGOOS 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
Keynote address by Moroccan High Ranking Official
Address by IOC-UNESCO, Colin Summerhayes
Presentation of the Workshop, Maria Snoussi

09:45 – 11:15 **Plenary lectures** Chairperson: Colin Summerhayes

Highlights of GOOS 1999, Colin Summerhayes, Director of GOOS Project Office

GOOS inter-regional collaboration and the role of EuroGOOS in the Mediterranean, Nic Flemming, Director of Euro-GOOS office

The strategy of MedGOOS, Silvana Vallerga, Chairperson of MedGOOS

The GOOS-Africa perspective, Geoff Brundrit, Chairperson of GOOS-AFRICA

ODINAFRICA, Mike Odido, Regional Co-ordinator

Co-development of Technical Capacities for MedGOOS, Jan Stel, Chairman of the GOOS capacity building Committee

11:15 – 11:45 Coffee Break

11:45 – 13:30 **Mediterranean Projects**

	The Mediterranean Forecasting System Pilot project, Nadia Pinardi, *Project Co-ordinator* MEDAR- MedAtlas, Catherine Maillard, Project Co-ordinator MedGLOSS, Dov Rosen, *Regional Co-ordinator* MedPOL/UNEP – MAP, Francesco Saverio Civili, *UNEP-MAP*
13:30	Lunch
15:00-16:30	Presentation of National activities of South and East Mediterranean Countries *Chairperson: Aldo Drago*
16:30-17:00	Coffee Break
17:00-18:00	EU Programmes for the Mediterranean and Operational Oceanography *Chairperson: Geoff Brundit* EESD, Alan Edwards. DG XII, Brussels EC MAST, Elisabeth Lipiatou, *Science Officer in Charge, EC-DG XII* MEDA, Sergio Gomez y Paloma, *JRC – IPTS, Sevilla, Spain* INCO, Maria Kayamanidou, *DG XII, Brussels*

Tuesday 2 November

	Chairperson: Nadia Pinardi
09:00-09:30	Naval Operational Oceanography, ONR CAOS, Nenad Smodlana
09:30-10:30	Formation of the working groups for actions to start the implementation of MedGOOS – Tentative list
Title 1	WG-1 Networking and sharing of resources
Title 2	WG-2 Capacity building and Training
Title 3	WG-3 Consolidation and expansion of observing systems

In the opening session of each Working Group, participants will be asked to give a brief description of the activities of their respective institutes relevant to 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

Plenary Sessions will be called during the day for an update and exchange of views between 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 ORGANISING COMMITTEE

International Organising Committee

S. Vallerga, Chairperson of the MedGOOS and Chairperson of the Workshop

G. Brundrit, Chairman of GOOS-AFRICA

A. Drago, Executive Secretary of the MedGOOS

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

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

F.S.Civili, UNEP-MAP Co-ordinator of the MEDPOL Programme

Y. Halim, Member of HOTO Panel

N. Flemming, Director of the EuroGOOS

G. Kullenberg, Executive director of the International Ocean Institute

M. Snoussi, Chairperson of the Local Organising Committee

J. Stel, Netherlands Geosciences Foundation

International secretariat contact

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ANNEX III

THE NATIONAL ORGANISING COMMITTEE

LOCAL ORGANISING COMMITTEE

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M. Dahhou, Boucham, A Merzouk, Ammar, B.K. Hilmi.

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ANNEX V

OPENING ADDRESSES.

Address by
The Secretary of State for Scientific Research

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 Océnographique 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 Méditérranéenne** ».

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 Méditérranée ainsi que ceux venant des pays non méditérranéens.

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 Méditérranée, au Nord-Ouest de l'Afrique et à quelques kilométres 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 méditérranéen, 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 privéliège 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 sauvegrade de l'environnement marin, la conservation des espèces, la gestion des ressouces énergétiques etc.

A titre d'exemple, la production halieutique nationale pour l'année 1998 est estimée à 700 000 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 une surexploitation le long de de la côte atlantique par rapport à celle de la Méditérranée. 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 méditérranéen. 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 méditérranéenne.

Mesdames et Messieurs,

Nous sommes aujourd'hui particulièrement honorés d'inaugurer les travaux de cet atelier régional qui se tient dans notre pays, 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 Méditérranée.

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 Méditérranée**.

Dans le cadre de MedGOOS, il s'agira de développer la contribution des activités maritimes au PNB, particulièrement pour les états côtiers de la rive Sud de la Méditerrannée ; 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 à encourager la coopération multilatérale pour l'accés 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 outreaches 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 to facilitate 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 at 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 are 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 organising team who have worked hard to enable us to take things forward. I would also like to thank the International Organising 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 VI

ACRONYMS

COP	CONFERENCE OF THE PARTIES
DBCP	DATA BUOY CO-OPERATION PANEL
DNA	DESIGNATED NATIONAL AGENCY
GEF	GLOBAL ENVIRONMENT FACILITY
GODAE	GLOBAL OCEAN DATA ASSIMILATION EXPERIMENT
GOOS	GLOBAL OCEAN OBSERVING SYSTEM
HOTO	HEALTH OF THE OCEANS
ICSU	INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS
IOC	INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
IODE	INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE
IOI	INTERNATIONAL OCEAN INSTITUTE
IOS	INITIAL OBSERVING SYSTEM
IUCN	WORLD CONSERVATION UNION
JCOMM	JOINT WMO-IOC COMMISSION FOR OCEAN AND MARINE METEOROLOGY
MFSPP	MEDITERRANEAN FORECASTING SYSTEM PILOT PROJECT
MoU	MEMORANDUM OF UNDERSTANDING
NODC	NATIONAL OCEANOGRAPHIC DATA CENTRE
OGS	OSSERVATORIO GEOFISICO SPERIMENTALE (Italy)
PACSICOM	PAN-AFRICAN CONFERENCE ON SUSTAINABLE INTEGRATED COASTAL MANAGEMENT
PIRATA	PILOT RESEARCH ARRAY OF BOYS IN THE TROPICAL ATLANTIC
SAREC	SWEDISH AGENCY FOR RESEARCH CO-OPERATION WITH DEVELOPING COUNTRIES
SIDA	SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY
TAO	TROPICAL ATMOSPHERE OCEAN ARRAY OF BUOYS IN THE EQUATORIAL PACIFIC
UNEP	UNITED NATIONS ENVIRONMENT PROGRAMME
UNESCO	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION
US-ONR	OFFICE OF NAVEL RESEARCH (USA)
WMO	WORLD METEOROLOGICAL ORGANISATION