



Intergovernmental Oceanographic Commission
Workshop Report No. 173

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

Rabat, Morocco
1-3 November 1999

Intergovernmental Oceanographic Commission
Workshop Report No. 173

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

Rabat, Morocco
1-3 November 1999

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.

GOOS Report No. 85

UNESCO 2000

TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
1.1 OPENING OF THE MEETING	3
2. ADMINISTRATIVE ARRANGEMENTS	4
2.1 ADOPTION OF THE AGENDA	4
2.2 DESIGNATION OF THE RAPPORTEUR	4
3. PLENARY LECTURES	4
3.1 HIGHLIGHTS OF GOOS 1999	4
3.2 GOOS INTER-REGIONAL COLLABORATION AND THE ROLE OF EuroGOOS IN THE MEDITERRANEAN	5
3.3 THE STRATEGY OF MedGOOS	6
3.4 THE GOOS-AFRICA PERSPECTIVE	6
3.5 ODINAFRICA	7
3.6 CO-DEVELOPMENT OF TECHNICAL CAPACITIES FOR MedGOOS	7
3.7 NAVAL OPERATIONAL OCEANOGRAPHY	8
3.8 EUROPEAN UNION PROGRAMMES FOR THE MEDITERRANEAN AND OPERATIONAL OCEANOGRAPHY	9
3.8.1 Operational Oceanography in the Fifth Framework Programme	9
3.8.2 EC Mast Projects and Results in the Mediterranean Sea	9
3.8.3 CAOS - A Proposed Regional Activity of C-GOOS and MedGOOS	9
4. MEDITERRANEAN PROJECTS	10
4.1 MEDITERRANEAN FORECASTING SYSTEM PILOT PROJECT	10
4.2 MEDITERRANEAN DATA ARCHEOLOGY AND CONCERTED ACTION (MEDAR –MEDATLAS II)	10
4.3 THE STATUS OF MEDGLOSS SEA-LEVEL PILOT NETWORK	11
4.4 CO-ORDINATED MEDITERRANEAN POLLUTION MONITORING AND RESEARCH PROGRAMME	11
5. PRESENTATION OF NATIONAL ACTIVITIES OF SOUTH AND EAST MEDITERRANEAN COUNTRIES	12
6. WORKING GROUPS	12

	Page
7. PLENARY SESSION	14
8. CLOSURE	14

ANNEXES

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

IOC Workshop Report No. 173
Paris, March 2001
Original: English

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 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 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).

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 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 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.

MedGOOS Meeting, Rabat, November 1999



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 Organization'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 Vallergera, 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 Organising 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 IGOS 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 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 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) 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 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 (FP5). 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-12, 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 (MFSP): 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, from 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 Organising 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. (IOCIODE 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 Organising 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 ORGANISING 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 ORGANISING COMMITTEE

Belcadi S.

Boucham

Bouksim Orbi H.

Dahhou M.

Hatimi N. El.

Hilmi Anmar, B.K.

Labraimi M.

Merzouk A.

Selassi M. L.

Snoussi M. Chairperson

Tabet N.

Tber Y.

ANNEX III

LIST OF PARTICIPANTS

ABDELBAKI Ahmed
Laboratoire d'Etudes Maritimes
30 Rue Asselah Hocine
Alger
Algeria
Tel: +213 2 73 8019
Fax: +213 2 73 8061
E-mail: lem@ist.cerist.dz

ABDELLAH Ammar
Faculté des Sciences de Rabat
Université Mohammed V
Rabat
Morocco
Tel/Fax: +212 7771957
E-mail: ammar@fbr.ac.ma

ABOUZI Mustapha
Office National de la Recherche Pétrolière
(ONAREP)
Rabat,
Morocco
Tel: +212 7794480
Fax: +212 281626

ALMED Ismail El Ibiary
Legal Consultant (environnement)
National Institute of Oceanography &
Fishery
101 Kasr El-eing str.
Cairo
Egypt
Tel/Fax: +202 5941339

AMANI A. Ismael
Faculty of Science
Alexandria, 21511
Egypt
Tel: +203 5969285
Fax: +203 5457611
E-mail: sc_alex2@crs.sisnet.net

AMIN Ekram M.
National Institute for Oceanography &
Fisheries
Ministry of Scientific Research
101 Kars El-Ainy Street
Cairo
Egypt
Tel: +202 594 1341
Fax: +202 594 1341
E-mail: niof@hotmail.com

BARALE Vittorio
Space Applications Institute
Joint Research Centre, European Commission
21020 Ispra (VA)
Italy
Tel: +39 0332 789274
Fax: +39 0332 789034
E-mail: vittorio.barale@jrc

BARBERINI Marina
ICRAM
Via di Casalotti, 300-00166 Roma
Italy
Tel: +39 06 615 70 410
Fax: +39 06 615 50 581
E-mail: mbarberini@tin.it

BEACH Reginald
US Office of Naval Research,
London
United Kingdom
E-mail: Rbeach@onreur.navy.mil

BOARGOB Abdul Fattah
Department of Environmental Studies
Technical Centre for Environment Protection
Turkey Street - Eldhara
P.O. Box 83618 Tripoli
Libyan Arab Jamahiriya
Tel: +218 21 444 84 52, 444 57 95
Fax: +218 21 333 80 98

BOSKO Telenta
EURO Mediterranean Centre on Insular
Coastal Dynamics (ICOD)
St. Paul Street, Valletta
Malta
Tel: +356-230042/ext: 2 356-243616
Fax: +356-230551
E-mail: btelenta@icod.org.mt
website/te: <http://www.icor.org.mt>

BRUNDRIT Geoff
Chairman of GOOS-AFRICA
Department of Oceanography
University of Cape Town
Rondebosch 7701
Cape Town
South Africa
Tel: +27 21 650 3277
Fax: +27 21 650 3979
E-mail: brundrit@physci.uct.ac.za
elley@physci.uct.ac.za

CHATRE Boubker
Ministère Energie-Mines
Directeur Division Géologie
Appuis Techniques
Rabat-Agdal
Morocco
Tel.: +212-07-68 84 00 poste 8107
Fax.: +212-07-65 84 84

CIVILI Francesco Saverio
Coordinator
MED POL Programme
UNEP-MAP
Vassileos Koutanstinou, 48
11635 Athens
Greece
Tel: +301 727 3106
Fax: +301 725 3196-7
E-mail: Fscivili@unepmap.gr

DRAGO Aldo
MedGOOS Secretary
Malta Council for Science and Technology
36, Old Mint Street
Valletta VLT 12, Malta
Tel: +356 241176/244965
Fax: +356 241177
E-mail: genmcst@keyworld.net

EDWARDS Alan
DG Research, European Commission,
Rue de la Loi, 200, B-1049 Brussels
Belgium
Fax: +32 2 296 3024
E-mail: alan.edwards@dg12.cec.be

EL Ibiary Ahmed Ismail
Legal Advisor for Environmental Issues
National Institute for Oceanography and
Fisheries (NIOF)
101 Kasv El-eing str.
Cairo, Egypt
Tel/Fax: +202 5941339

EL Haddad Mustapha
Office National des Pêches
15 rue Lieutenant Mahroud
B.P. 16243-20300
Casablanca
Morocco
Tel: +24 05 51-24 55 53
Fax: +24 23 05
E-mail: elhaddad@onp.co.ma

FARHAT Aounallah
Institut National de la Météorologie
B.P.156, 2035 Tunis Carthage,
Tunisia
Tel: +216 1773400
Fax: +216 1772609

FLEMMING Nicholas
Director EuroGOOS
Southampton Oceanography Centre
Room 014/12
Empress Dock
Southampton SO14 3ZH
United Kingdom
Tel: + 44 2380 596242/596262
Fax: + 44 2380 596399
E-mail: n.flemming@soc.soton.ac.uk

FOTHI Abdellah
LPEE (Laboratoire Public d'Essai et
d'Etudes)
Km 7 Route d'Eljordiola,
Casablanca
Maroc
Tel: +02 230728

GIOVANARDI Franco
ICRAM
Via di Casalotti, 300-00166 Roma
Italy
Tel: +39 06 615 70 401
Fax: +39 06 615 61 906
E-mail: frankgio@tin.it

HALIM Youssef
GOOS HOTO Panel
Faculty of Science
Alexandria 21511
Egypt
Tel: +203 586 9661
Fax: +203 545 7611
E-mail: asclub@soficom.com.eg

HAMOUMI Naima
Mohammed V Agdal
University
Tel/Fax: +212 7771957
E-mail: hamoumi@fsr.ac.ma

KOUYOUMJIAN Hratch
National Centre for Marine Science/CNRS
P.O. Box 534
Batroun
Lebanon
Tel: +961 6741582/3
Fax: +961 6741584
E-mail: kuymjian@cnrs.edu.lb

KUPUSOVIC Tarik
HYDRO- Engineering
Stjepana Tomica 1
Sarajevo 71000
Bosnia-Herzegovina
Tel: +387 71 207949 / 212466
Fax: +387 71 207949
E-mail: tkupusovic@utic.net.ba

LATIF Youssef Abdul
Marine Research Institute
Tishreen University
P.O. Box 2242
Lattakia
Syrian Arab Republic
Tel: +963 41 428658 / 420650
Fax: +963 41 428780

LIPIATOU Elisabeth
DG Research, European Commission
Rue de la Loi, 200,
B-1049 Brussels
Belgium
Fax: +32 2 296 30 24
E-mail: elisabeth.lipiatou@dg12.cec.be

MALLIARD Catherine
SISMER-IFREMER
B.P. 70
29280 Plouzane
France
Tel: +33 2 98 22 42 79
Fax: +33 2 98 22 46 44
E-mail: catherine.maillard@ifremer.fr
sismer@ifremer.fr

MANZELLA Giuseppe
ENEA-CRAM
P.O. Box 316, La Spezia 19100
Italy
Tel: +39 187 536 215
Fax: +39 187 536 273
E-mail: manzella@estof.santateresa.enea.it

MOROVIC Mira
Institute of Oceanography and Fisheries
Mestrovicovo Setaliste 63
P.O. Box 500, 21000 Split
Croatia
Tel: +385 21 358688
Fax: +385 21 358650
E-mail: more@izor.hr

MOSETTI Renzo
Osservatorio Geofisico Sperimentale
P.O. Box 2011, 34016 Opicina (TS)
Italia
Tel: +39 040 2140268
Fax: +39 040 2140266
E-mail: rmosetti@ogs.trieste.it

ODIDO Mika
Regional Dispatch Centre
RECOSCIX-WIO
P.O. Box 95832
Mombasa,
Kenya
Tel: +254 11 472527
Fax: +254 11 475157
E-mail: m.odido@recosix.com

PETELIN Boris
Marine Biological Station Piran
Fomace 41
Piran 6330
Slovenia
Tel: +386 66 746368
Fax: +386 66 746367
E-mail: malacic@morje.msp.nib.si

PINARDI Nadia
ISAO-CNR
Via Gobetti 101
40129 Bologna
Italy
Tel: +39 051 639 8015
Fax: +39 051 639 8132
E-mail: n.pinardi@isao.bo.cnr.it

PURINI Roberto
ITS - CNR
Director
Viale ROMOLOGESSI 2 Trieste
Italy
Tel: +39 040 305403
Fax: +39 040 308941
E-mail: purini@itt.ts.cnr.it

ROSEN Dov S.
IOLR
Tel Shikmona
P.O. Box 8030
Haifa 31080
Israel
Tel: +972 48 515 202
Fax: +972 4 8511 911
Mobile: +972 52 844 174
E-mail: rosen@ocean.org.il

SAADALLAH Mohamed
Office National de l'Eau Potable
Complexe du Bouregreg Avenue Akrach
11500 Rabat
Morocco
Tel: +212 775 96 01
Fax: +212 775 23 77
E-mail: onepdlq@mtds.com

SAADIA Bahaj
Direction de Mines
P.B. 6208 Rabat
Insitutes Morocco
Morocco
Tel: + (212) 7688731
Fax: + (212) 1185940
E-mail: bahajsa@notmizil.com

SALIHOGU Ilkay
METU Institute of Marine Sciences
P.O. Box 28, Erdemli 33731
T-Icel
Turkey
Tel: +90 3245212150/3245212745
Fax: +90 3245212327
E-mail: ilkay@ims.metu.edu.tr

SAMMARI Chérif
INSTM
28, Rue 2 Mars 1934
2025 Salamambo
Tunisia
Tel: +216 1 730 548/420
Fax: +216 1 732 622
E-mail: cherif.Sammari@instm.rnrt.tn

SARF Farida
National Institute of Fisheries Research
2 rue de Tiznit
Casablanca
Tel.: +212-2-26 81 92/22 20 90
Fax.: +212-2-26 69 67
E-mail: fsarf@yahoo.com

SMODLAKA Nenad
Ruder Boskovic Institute
Center for Marine Research
G. Paliaga 5, Rovinj 52210
Croatia
Tel: +385 52 830 401
Fax: + 385 52 813 496
E-mail: smodlaka@cim.irb.hr

SNOUSSI Maria
Université Mohammed V
Faculté des Sciences
Département de Géologie
Avenue ibn Battouta
B.P. 1014 Rabat
Morocco
Tel: +212 7 675909
Fax: +212 7 771957
E-mail: snoussi@fsr.ac.ma

STEL Jan
International Centre for Integrative Studies
Kapoensstraat 23
P.O. Box 616
6200 MD Maastricht
The Netherlands
Tel: +31 43 3883943
Fax: +31 43 3884916
E-mail: jh.stel@icis.unimaas.nl

SWAILEH Khalid
Department of Biology and Biochemistry
Birzeit University,
P.O. Box 14
Birzeit, West Bank
Palestine
Tel: +970 2 298 2162
Fax: +970 2 295 7656
E-mail: ks@hotmail.com
ks@science.bizeit.edu

TZIAVOS Christos
National Centre for Marine Research
Agios Kosmas
Hellinikon 16604
Athens
Greece
Tel: +30 1 98 884 12
Fax: +30 1 98 330 95
E-mail: ctziav@posidon.ncmr.ariadne-t.gr

VALLERGA Silvana (Chair of the
Workshop)
MedGOOS Chairperson
CNR & IMC
Localita' Sa Mardini
09072 TorreGrande - Oristano
Italy
Tel: +39 0783 22027/22136
Fax: +39 0783 22002
E-mail: vallerga@nameserver.ge.cnr.it

VUCIJAK Branko
Hydro-Engineering Institute
Stjepana Tomica 1
71.000 Sarajevo
Bosnia and Herzegovina
Tel. +387 71 212 466
Fax. +387 71 207 949
E-mail: bvucijak@utic.net.ba

ZENATI Younes
ISTPM
Route d'Aghezdis
Agadir, B.P. 479
Maroc
Tel: +844170
Fax: + 845858
E-mail: istpm@Agadirnet.net.ma

ZODIATIS George
Lab. of Physical Oceanography
Ministry of Agriculture, Natural Resource
and Environment
Aeolou 13
1416, Nicosia
Cyprus
Tel: +357 2 807814/303803
Fax: +357 2 775955
E-mail: gzodiac@spidernet.com.cy

IOC Secretariat

AHANHANZO Justin
Technical Secretary, GOOS Project Office
IOC/UNESCO
1, rue Miollis
75732 Paris, Cedex 15
France
Tel: +33 1 45683641
Fax: +33 1 45685810/12/13
E-mail: j.ahanhanzo@unesco.org

SUMMERHAYES Colin
Director, GOOS Project Office
IOC/UNESCO
1, rue Miollis
75732 Paris, Cedex 15
France
Tel: +33 1 45684042
Fax: +33 1 45685810/12/13
E-mail: c.summerhayes@unesco.org

ANNEX IV

OPENING ADDRESSES

*Address by
The Secretary of State for Scientific Research of Morocco*

**Messieurs les Ministres
Monsieur le Représentant de la Commission Océanographique 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

et 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 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 a une surexploitation le long 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 (MFSP).

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 Vallergera 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 (UNESCO)
IGOSS	Integrated Global Ocean Services System
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 Technical Commission for Oceanography and Marine Meteorology
MAP	Mediterranean Action Plan
MAST	Marine Science and Technology Programme
MEDAR-MEDATLAS	Mediterranean Data Archeology and Concerted Action
MEDPOL	Co-ordinated Mediterranean Pollution Monitoring and Research Programme
MFSP	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
PIRATA	Pilot Research Array of Buoys 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 Naval Research (USA)
VOS	Voluntary Observing Ship
WMO	World Meteorological Organisation
XBT	Expendable Bathythermograph