



IODE National report on Oceanographic Data Management and Exchange for Malta

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**Eighteenth Session of the IOC Committee on International Oceanographic Data and
Information Exchange (IODE-XVIII)
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**IODE NATIONAL REPORT ON
OCEANOGRAPHIC DATA MANAGEMENT
AND EXCHANGE
FOR MALTA**

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3. **Data Center Address:**
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4. **Data Center URL:**
www.capemalta.net/pounit
5. **IODE Data Center Designation Date:**
Malta has not yet established an NODC but the PO-Unit is responsible as IODE contact point in the country.
6. **Description of national data flow:**

Metadata management and Data tracking

The PO-Unit provides support to local entities involved in marine research and monitoring to collect and maintain oceanographic data according to international standards. This includes promotion of practices for ocean data quality control, trans-coding and management. The PO-Unit plays the role of keeping track of ocean observations made in the vicinity of the Maltese Islands. Data collected by individual scientists, local institutes/agencies and governmental departments is primarily kept under the respective sources, and under different often incompatible formats. The PO-Unit aims to identify these data holdings and to bring the data under one database with standardized formats.

In the past few years there has been a large effort conducted by the PO-Unit to backtrack marine research projects and monitoring activities in Malta, and to identify, describe and/or collect related data sets. Metadata information from a large number of such activities has been compiled in EDMERP and EDMED formats.

The information relating to routine marine monitoring or operational activities has been compiled and forms part of the ***Mediterranean Directory for Operational Oceanography*** (MeDir-OP). MeDir-OP is an internet-based graphical and searchable directory prepared by the IOI-Malta Operational Centre under the MAMA project in collaboration with the major

marine institutes in all the Mediterranean countries. The database can be accessed from:
<http://www.capemalta.net/mama/wp1interface/index.html>

The PO-Unit has furthermore recently launched the **MaltaBluePages** which can be accessed from <http://capemalta.net/bluepages/index.php>. This is an online local oceanographic database that is provided as a service to the local community. The MaltaBluePages is serving to demonstrate the advantages of pooling oceanographic data together, and this is expected to enhance the exchange and sharing of oceanographic data locally. Similarly the **Malta Page for Operational Oceanography** offers a one-stop web-access to operational meteo-marine information, bulletins and forecasts relevant to the Maltese Islands, by bringing together local and external sources and service providers under a common and user-friendly webpage. These services offered from the PO-Unit website

(<http://www.capemalta.net/partnerpage/index.html>) are intended to give higher visibility to operational oceanography and derived products.

This endeavour of the PO-Unit will soon culminate in the launching of an on-line comprehensive and state-of-the-art system for the management, viewing, searching and updating of oceanographic metadata.

All these initiatives are intended to target and promote the local pooling of oceanographic data and metadata. The strategy is to provide services that show the benefits and prove the need of sharing and putting oceanographic data and information together, and to subsequently reap an increased cooperation and participation by the largest number of local entities.

7. What is the structure of marine data management in your country:

The PO-Unit keeps contact with all national entities involved in marine research and monitoring. This provides the avenue by which archives on metadata information are kept updated. The following table gives brief descriptions of their activities and data holdings.

Agency	Research Fields	Main Ongoing Projects	Description of Data Holdings
Physical Oceanography Unit (IOI-MOC)	Coastal meteorology, hydrography, physical oceanography and experimental study of the hydrodynamics of the sea around the Maltese Islands.	Sea-level data in the Maltese coastal area MedGLOSS Sea Level Station Meteo station Hydrographic measurements Measurements of subsurface sea currents	Water Level recordings since 1993 at Mellieha Bay Temperature, atmospheric pressure and sea-level recordings since 2001 Meteorological data collected at Ramla Tal-Bir since 1994 Physical oceanographic surveys of parts of the NW coast of the Maltese Islands Subsurface currents at stations along the northern and southeastern coast of the Maltese Islands, and in the Comino Channels

<p>Malta Environment and Planning Authority</p> <p>Environment Protection Directorate</p>	<p>Protection and conservation of the Maltese environment, flora in particular</p> <p>Monitoring of water quality</p>	<p>Biodiversity Monitoring Project (BMP)</p> <p>National Marine Monitoring Programmes: Trend and Compliance</p>	<p>Database for the BMP, including entries from the Biodiversity Record Sheet Programme</p> <p>Data on threatened flora and important plant areas</p> <p>State of the Environment Report</p> <p>Data relevant to bathing water quality gathered for the last 8 years</p> <p>Data relevant to quality of offshore coastal waters and heavy metal and hydrocarbon content of marine sediments gathered for the last 4 – 5 years</p>
<p>Malta Centre for Fisheries Sciences</p>	<p>Scientific fisheries research and monitoring</p>	<p>COPEMED (FAO) Project includes the following :</p> <ul style="list-style-type: none"> - Artisanal Fisheries - Tuna Population Dynamics - The Fishery, Biology and Management of Dolphin–Fish - Fisheries Sampling Network <p>MEDITS trawl survey exercise</p> <p>MEDSUDMED</p>	<p>MALTASTAT – A Computerised Fisheries Statistics and Catch Assessment System</p> <p>Abundance of demersal marine resources on a regional and sub regional basis</p> <p>An FAO project for an eco-system based approach to fisheries management in the central Mediterranean.</p> <p>Web-based national/sub regional information system</p>

			to manage fisheries-related datasets and information
University of Malta Department of Biology	Marine Ecotoxicology - environmental monitoring related to biological responses to marine pollution	Assessment of Pollution Biomonitoring in the Mediterranean Airborne Remote Sensing Techniques Simulation for Assessment, Monitoring and Surveillance of South-Mediterranean Maritime Ecosystems Environmental Monitoring of Maltese Coastal Waters using Remote Sensing	Coastal surveillance data (related to oil pollution and fisheries) using satellite and air-borne radar images Data bank on water quality as surveyed in eight coastal inshore areas to monitor eutrophication and transport of land-based discharges. Colour-coded output maps of the sites showing LANDSAT TM-based images of turbidity, suspended solids, surface water temperatures and chlorophyll a levels.
Department of Biology (cont.)	Marine research on migratory and pelagic organisms and coastal conservation research	Cetacean project: identification of species found in the Central Mediterranean Region and studies on their distribution and abundance Bluefin tuna project: investigation of stock structure and migration of the species	Photo-ID system project for species found close to the Maltese Coasts Measurements (and genetic and environmental analyses) of bluefin tuna individuals in samples gathered over 3 years
Department of Biology (cont.)	Coastal and Marine Ecology	Faunistics and ecology of the Maltese Islands Biodiversity, functional structure and conservation of deeper water benthic assemblages of the Maltese Islands	Data on the faunistics and coastal and marine ecology Data related to sublittoral marine benthic assemblages

Euro-Mediterranean Centre on Insular Coastal Dynamics (ICoD)	Meteo / Marine Numerical modelling	COMPASS, RAMSES, LAND-13	Near operational 16Km resolution forecasts of Mediterranean Meteo - Marine parameters with option for specific area forecasts at 4km resolution. Historical data access since 1997 www.icod.org.mt
		Remote Sensing	
		Multi-Spectral Scanning of select coastal areas. Thermal Imagery for select Maltese / southern Sicilian coasts with a thermal resolution of 0.03Kelvin. Digital imaging of Maltese Island Coastline and select southern Sicilian coast. with 50cm resolution. Select Satellite Images (Landsat, SPOT, SAR) of coastal areas in the Central & Eastern Mediterranean since 1997. Select In-situ marine water quality for Maltese, Crete & Sicilian coastal areas.	
		AGRISTAT	Maltese Islands / coastal wide coverage with aerial digital imagery (25cm resolution).
	Coastal Zone Management	Oil Pollution Contingency Plans	Sensitivity maps for the entire Maltese coastline
Meteorological Office	Meteorology		Meteorological data (analogue/digital)
Malta Maritime Authority Hydrographic Office	Hydrography		Coastal Bathymetry (digital); (tides/analogue)
Office of the prime Minister Oil Division	Geophysical		Marine seismic data

The Physical Oceanography Unit (PO-Unit) undertakes fundamental research in coastal meteorology, hydrography and physical oceanography with a main emphasis on the experimental study of the hydrodynamics of the sea in the vicinity of the Maltese Islands. It offers facilities for the gathering, processing, analysis and management of high quality physical oceanographic observations both for long term and baseline studies as well as for general applications in marine environmental research and assessments. The Unit endeavours to enhance its activity on an operational scale by the installation and maintenance of permanent monitoring systems which provide data for ocean forecasting, and by applying numerical modelling techniques in the study

of physical marine systems. It operates in collaboration with international organisations with whom it has expanded its activities through a number of funded research projects. The Unit provides services and technical support to local entities including government departments and private agencies. It organises conferences, seminars, workshops and specialised training programs in order to promote oceanography in Malta and in the Mediterranean.

The Malta Centre for Fisheries Sciences (MCFS) The Malta Centre for Fisheries Sciences is as an established advisory body and research centre in the fields of capture and culture fisheries. It serves the Fisheries Conservation and Control Division within the Ministry for Rural Affairs and the Environment by giving scientific and management advice on the exploitation of living marine resources within the framework of the Fisheries Conservation and Management Act (Chapter 425) and international fisheries legislation and instruments which have been ratified by Malta. The MCFS is also a focal point for international scientific fisheries bodies and regional fisheries research projects funded and / or coordinated by the Food and Agriculture Organisation (FAO) of the United Nations and by the European Union. In addition, it has embarked on several bi-lateral and multi-lateral research initiatives in collaboration with foreign and local institutions with interests in fisheries and other marine sciences as well as with private companies involved in the fisheries and aquaculture industries.

MCFS is participating in MedSudMed, a 4-year sub-regional fisheries research project which is expected to contribute to the novel concept of an "Ecosystem Approach to Fisheries" which was born at the FAO Reykjavik Conference in 2001. MedSudMed studies are focusing on the influence of the environmental parameters (biotic and abiotic) on the distribution and abundance of fisheries resources and on the identification of Marine Protected Areas (MPAs) to enhance or protect fish stocks.

Within the framework of MedSudMed, MCFS launched a National Data Collection and Aggregation Scheme in August 2003. This scheme was successfully completed in March 2004 and MedSudMed - MCFS are now focussing on the development of a web-based national / sub-regional database and information system which would manage data sets and information enabling multidisciplinary analysis which is vital for the implementation of an ecosystem approach to fisheries management. The information system would not only serve as a tool for fisheries science and management but also as a general data and information depository for marine scientists assisting them to manage their own data and integrate information from other contributors as required.

Moreover MCFS carries out several field surveys throughout the year within the framework of the EU data collection programme, FAO projects and bilateral projects with other countries; these are mainly trawl surveys, catch assessment surveys, egg / larvae surveys and acoustic surveys. Besides the collection of data on fisheries resources, some of these surveys include the collection of physical and other biological data which are often used in studies to correlate the distribution of fish stocks with abiotic and biotic parameters.

Malta Environment & Planning Authority (MEPA) is the regulatory authority which includes the Planning Directorate and the Environment Protection Directorate which is responsible for biodiversity protection, waste control and management and pollution control. The latter is responsible for various programmes aimed to control and abate environmental pollution.

The Euro-Mediterranean Centre on Insular Coastal Dynamics (ICoD), University of Malta, forms part of a network of specialised Centres pertaining to the Open Partial Agreement of the Council of Europe on Major Natural and Technological Hazards (EUR-OPA). ICoD was established in 1988 within the framework of the Foundation for International Studies at the University of Malta, as the "Euro-Mediterranean Centre on Marine Contamination Hazards" where it initially addressed marine degradation in general; it has subsequently re-oriented its objectives and activities towards a greater focus on the interactive processes which occur at the coastal zone and in particular, of insular areas. Its objectives are: to combat marine and

environmental degradation; to carry out research; to contribute to civil protection at the coast and to raise public awareness.

The Department of Biology, University of Malta, carries out research in the biological sciences. The Department aims to make a direct contribution to the sustainable management of our natural resources, and other national economic developments. The fields of interest of the Department are wide ranging and include the following: fisheries biology and marine aquaculture; marine pollution and environmental quality; local flora, fauna and ecology; population genetics; biodiversity and bioconservation. Over the past decade, the department has developed into a centre of excellence with respect to marine related sciences with most of the research work being centred on marine environmental resources, with fieldwork and diving.

8. What are the strengths and problems of the present arrangements nationally, regionally and internationally?:

The main weakness in the present arrangement for oceanographic data management are that:

- no formal and special national arrangements exist
- management and archival of data continues to be done in an ad hoc manner by many entities
- data quality control, management and archival does not figure out with enough emphasis and appropriate standard in the curriculum of University courses.

9. What improvements could be made nationally, regionally and internationally?:

- setting up of a designated national oceanographic data centre
- formal environmental data policy arrangements

10. What future national activities are planned?:

Local Awareness one-day seminar on ocean data management

11. Participation in regional or international projects

- **SEA SEARCH** is targeting to develop, maintain and electronically publish jointly meta-data products/directories to keep track of ocean and marine data and information. The project aims to improve the overall awareness, overview and access to ocean and marine data and information in Europe, including the Mediterranean Sea and the Black Sea. It is also enabling the exchange of experience and enhancing cooperation towards the development, promotion and implementation of data and information management practices and methods. In this project IOI-MOC has been working with a number of local marine-related organisations/entities to compile a national directory on (i) marine research activities, and (ii) marine data holdings. This is providing information for the Malta Blue Pages.

- The MedGOOS Secretariat



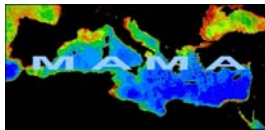
The MedGOOS is an informal association founded under the auspices of the UNESCO/Intergovernmental Oceanographic Commission (IOC) to provide a concerted approach to the planning and implementation of the Global Ocean

Observing System (GOOS) in the Mediterranean. The MedGOOS aims to facilitate the development of an operational ocean observing and forecasting system at a regional to coastal scale to the benefit of a wide group of users in the region. In the last year, three new institutes have joined MedGOOS: the Institute of Hydrometeorology (Albania), the Institut National des Sciences et Technologies de la Mer (Tunisia) and the Institute for Marine Biology (Yugoslavia). The National Council for Scientific Research (Lebanon) has also officially to applied join.

The MedGOOS Secretariat is hosted at the IOI-Malta Operational Centre and provides administrative support and assists in the co-ordination of MedGOOS activities. The Secretariat secures the continuous

flow of information related to MedGOOS and its project activities, among the members. Important developments, training opportunities, conferences, seminars, etc. related to ocean monitoring and forecasting in the region are circulated to the members by the MedGOOS Secretariat. This strengthens the network and brings its components closer together.

- The MAMA Project



The “**M**editerranean network to **A**ssess and upgrade **M**onitoring and forecasting **A**ctivity in the region (**MAMA**)” is a MedGOOS project. It provides a framework for the concerted basin-wide effort to establish the strong and common research infrastructure necessary for the setting up of the Global Ocean Observing System in the Mediterranean. MAMA is building on, strengthening and extending the MedGOOS network to all the Mediterranean nations. The strength of MAMA lies in its 31 participants coming from renowned marine institutions and stakeholders from all the countries in the region. The aims of MAMA are centered on the trans-national pooling of scientific and technological resources through the sharing of experiences and the transfer of expertise, to bring capacities at comparable levels, and provide an integrated effort towards the planning and design of the initial ocean observing and forecasting system in the Mediterranean. Through this project MedGOOS targets to provide guidance to the Mediterranean states and stimulate the necessary awareness, capacity building and pre-operational R&D to ensure that MedGOOS is fully effective when it is eventually established, hopefully in ten to twenty years time.

MAMA is being coordinated by the International Marine Centre (Oristano, Sardinia, Italy) and IOI-MOC. The MedGOOS Secretariat at IOI-MOC supports the networking between the MAMA partners, and also makes provisions for the logistic arrangements and organisation of the project meetings. Amongst the most important activities conducted during the project are:

- The Questionnaire on Marine Monitoring Activities in the Mediterranean – to build an inventory on the availability of technological infrastructures and equipment; human resources and funding capability; and existing national/international initiatives related to operational oceanography in the region.
- Country profiles prepared to give an overview on the operations of institutes/agencies dealing with the monitoring, assessment and forecasting of the state of the ocean and coastal areas; the national structure for the support and conduction of marine monitoring and research activities; the key public administration/authorities responsible for marine affairs, and for environmental policy formulation and implementation; the relevance of the maritime sector in the economic activities of each country; implications for MedGOOS in the optimal design and implementation of operational forecasting for maximal benefits to the coastal states.

The information from this MAMA survey provides the basis for an assessment on the needs and potentialities for operational oceanography in the region and for the design of the initial observing system. The collected information is compiled in an internet-based directory on operational oceanography in the Mediterranean.

- Mediterranean Directory for Operational Oceanography (MeDir-OP)

MeDir-OP is a web-based regional directory of Mediterranean key scientific or monitoring institutions supporting operational oceanography. It contains information on potential users of marine data, key public administrations responsible for marine affairs, and on the economic relevance of the maritime sector in the Mediterranean countries.

Observing platforms, instrumentation, method and type of measured variables, data processing and analysis, dissemination of products are listed together with other relevant details on routine monitoring activities. Searchable mini-databases collate specific information sets.

A user-friendly graphical interface shows on maps three sections of metadata categories:

Section 1 - Country Profiles

Key entities, research and monitoring programmes, administrations of marine affairs, marine sectors.

Section 2 - Marine institutes/entities related to Operational Oceanography

Institutions for ocean observations and/or forecasts, oceanographic data centres, national environmental agencies, other marine-related entities.

Section 3 - Research and Monitoring Programmes

Responsible entity and contacts, objectives, geographical area, key variables measured, platforms used, period of operation, source of funding.

The database can be accessed on-line from the MAMA web front-page (www.mama-net.org) or from www.capemalta.net/mama/wp1interface/index.html

MeDir-OP is a joint effort of the partners of the EC FP5 project MAMA. The online directory is prepared and maintained by the MedGOOS Secretariat at the IOI-Malta Operational Centre, University of Malta.

- The “GOOS Regional Alliances Network Development” (GRAND)



GRAND is an action in support of international cooperation for research on global change and ecosystems funded by the European Commission, 6th Framework Programme. GRAND is extending to the global scene the activity of the EC funded network MAMA – Mediterranean network to Assess and upgrade the Monitoring and forecasting Activity in the basin.

The main aim of GRAND is to strengthen the dialogue between regional initiatives promoting ocean monitoring and forecasting.

Large-scale operational ocean monitoring and forecasting networks, defined in the Global Ocean Observing System (GOOS), are needed to implement global conventions and agreements signed by the EU and its member states, including the United Nations Convention on the Law of the Sea, International Convention for the Safety of Life at Sea, Convention on

Biodiversity, Framework Convention on Climate Change, Programme of Action for Sustainable Development.

GOOS Regional Alliances co-ordinate the efforts of states around the world to implement GOOS. They have different capacities, resources and level of activity, but all seek to establish a global sustained system of observations to predict the state of the marine environment, to fulfill their duties in international agreements and to gain benefits for a variety of end-users and for public good.

GRAND brings together the GOOS Regional Alliances (GRAs) and is promoted by the IOC, (Intergovernmental Oceanographic Commission) and the I-GOOS (Intergovernmental Committee for GOOS). The partnership of GRAND covers all the planet's oceans to provide an opportunity, supported by Europe, for a harmonious development of the diverse regional systems within GOOS, while advancing the European contribution to the global system.

GRAND will facilitate the dissemination of best practice, technology transfer, development of international co-operation, establishment of observing systems in developing countries, application of results of EU projects to the broader international community active in the GRAs. This will help to strengthen the role of the EU on the international stage while contributing to the integration and strengthening of the European Research Area.

Project objectives

GRAND targets several goals that are of importance to the GOOS Regional Alliances to different degrees. The overarching aims are:

- To apply science and technology derived from the research community to operational oceanography
- To empower the GOOS Regions, and in particular to create a coherent structure to achieve capacity building appropriate to the needs of each region
- To learn from the GOOS Regions to enable to benefit by adopting "best practice" to meet the needs of individual GOOS Regions

The ultimate goal of GRAND is the preparation of a GOOS Regional Strategy that is intended to show how the performance of local marine environmental services can be improved through the exploitation of the global ocean observing system. The Strategy will resolve the related technical and management challenges, and identify the new technology that can link the global observations to applications required by customers such as in the tourism and leisure industries, in shipping and marine transportation, in marine safety and rescue, in fisheries and other areas.

In WorkPackage1 GRAND Information a survey is being conducted by IOI-MOC amongst GRAs to obtain information and evaluate on a regional basis: (i) the nature and extent of key marine environmental issues in the various GOOS regions, and (ii) the capabilities and assets currently deployed in terms of ongoing initiatives, methodologies and practices, technological infrastructures and equipment, resources and funding to address these issues