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# IOC/ROPME Planning Meeting for the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO)

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Abstract:
The IOC/ROPME Planning Meeting for the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO) was held in Tehran, I.R.Iran, from 2-5 October 2004 at the Iranian National Center for Oceanography (INCO). The meeting was co-sponsored by IOC, ROPME, and IOGOOS. The meeting was attended by participants from nine IOCINDIO countries and two countries of IOCWIO region. The meeting analysed the ocean data and information management capacity in the region, identified needs and capacity building requirements. The meeting reviewed the draft "Proposal for the establishment of the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO)" that shall now be entitled "Project Document for the Establishment of the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO)". The meeting recommended that, based upon information received from the participating countries, an updated version of the project document, with detailed budget requirements, be prepared for consideration and approval by IOCINDIO-IV (early 2005), IODE-XVIII (26-30 April 2005), IOC-XXIII (June 2005) and relevant ROPME meetings with the view of starting fund requiring activities as soon as possible in 2005 as detailed in the work plan.

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## 1. OPENING

The Workshop was opened on Saturday 2 October 2004 by Dr. Nasser Hadjizadeh Zaker, Chairman of IOCINDIO and also Chair for the meeting. In his opening address Dr Zaker welcomed the participants on behalf of the Iranian National Center for Oceanography. He highlighted the importance of acquiring, managing, archiving and disseminating data, as well as the capacity for the countries bordering the Indian Ocean to generate information in support of decision making and management of the oceans and coastal zones. He described the history of the ODINCINDIO project proposal and wished the delegates from the Indian Ocean Rim and representatives from IOC, IOGOOS and ROPME successful results for this meeting and also a very happy and enjoyable stay in Iran (full text of the speech is included in Annex VI).

Dr. Abdin Salih, Representative and Director of the UNESCO Tehran Office, addressed the meeting on behalf of the Director General of UNESCO, Mr. Koichiro Matsuura, and himself as the representative of UNESCO in the Islamic Republic of Iran. He thanked the Government of the Islamic Republic of Iran, particularly the Ministry of Science, Research and Technology for their excellent cooperation with UNESCO in all areas of its programmes. He also welcomed with appreciation ROMPE's partnership with UNESCO in various projects related to its mandate and UNESCO's objectives. He stated that the main topics of the workshop represent a very important contribution to capacity building and sustainable development with regard to oceanographic issues that certainly receives great support from UNESCO. UNESCO hopes and intends to play an active part in the implementation of relevant recommendations resulting from the meeting deliberations. The role of the Iranian Center for Oceanography in promoting this partnership at the national, regional and international levels is greatly valued by UNESCO (full text of the speech is included in Annex VI).

Mr. Peter Pissierssens, Head of IOC's Ocean Services Section, speaking on behalf of Dr Patricio Bernal, Executive Secretary IOC, recalled that in the IOC context, oceanographic data and information management and exchange is the responsibility of the International Oceanographic Data and Information Exchange (IODE) Programme. Established in 1961, IOC Member States cooperating in IODE has established a network of 65 data centres in as many countries. The centres take responsibility for the quality control, management, dissemination and archival of oceanographic data at the national level and they also ensure the international exchange of the data and their archival at the World Data Centres Oceanography, a network that is part of ICSU.

IODE also has a role to play in data management serving operational oceanography. The GOOS Data and Information Management Strategy Plan (2001) states that ""The GOOS Data and Information Management System will be a highly distributed system based on contributions by operational agencies, data centres and research organizations in the oceanographic and meteorological communities."

A core element in data and information management s the free flow of data. After three years of deliberations, the IOC Assembly, during its 22nd Session (July 2003), adopted Resolution IOC-XXII.6 "IOC Oceanographic Data Exchange Policy" and the preamble says it all: "The timely, free and unrestricted international exchange of oceanographic data is essential for the efficient acquisition, integration and use of ocean observations gathered by the countries of the world for a wide variety of purposes, including the prediction of weather and climate, the operational forecasting of the marine environment, the preservation of life, the mitigation of human-induced changes in the marine and coastal environment, as well as for the advancement of scientific understanding that makes this possible." A prerequisite for

any operational observing system and the development of its services and products will thus be the free and unrestricted flow of data between all partners of that system.

In the Indian Ocean and Gulf context an important milestone has been the start of the IOGOOS in November 2002, when 16 institutions in the region decide to sign an MOU that established IOGOOS.

To build all elements of IOGOOS it will be necessary to ensure that all partners in the region have the required capacity. In the wider Indian Ocean region very few countries have established national oceanographic data centres. This is of concern as a substantial amount of research and observation work in ongoing in the region. It is unclear whether the data collected are actually managed, archived and thus made available to the regional and global ocean and climate research community.

Being aware of the risk of loss of a huge amount of data sets in this region, a proposal has been formulated for the development of an Ocean Data and Information Network for the Indian Ocean region.

Mr. Pissierssens thanked the Islamic Republic of Iran for hosting this meeting at INCO. He also expressed IOC's high appreciation to ROPME for co-sponsoring this event.

Dr. Hassan Mohammadi, Acting Coordinator of the Regional Organization for the Protection of the Marine Environment (ROPME), also welcomed the participants and conveyed the greetings and well-wishing of H.E. Dr. Abdul Rahman Al-Awadi to all of them. He expressed appreciation to the organizers, IOC Secretariat, IODE, GOOS and IOCINDIO for the invitation extended to ROPME and its Member States to participate in the Meeting. He further thanked INCO for hosting the event, for the excellent arrangements and the kind hospitality.

Dr. Mohammadi underlined the importance of an integrated system for environmental data and information in the ROPME Region and welcomed the ODINCINDIO project for addressing the issue in a comprehensive manner. Needless to say, there are huge amounts of oceanographic, contaminants and remote sensing data available that need to be processed and disseminated in an efficient manner. Such being the case, ROPME Secretariat is in the process of developing an environmental data and information system, which could be associated with the ODINCINDIO project. He assured the meeting of future close collaboration between ROPME and IOC to this effect.

Dr. Zaker then introduced the timetable for the meeting (included as Annex I). The list of participants is attached as Annex V.

## 2. NATIONAL PRESENTATIONS

All participants were requested to provide an overview on the status of data and information management in their country. The full presentations will be made available through the IOCINDIO web site on http://ioc.unesco.org/iocindio/ .

### 2.1. **Bahrein** (extract from the full report)

Marine data is collected for a very wide range of purposes, and each project differs in scale, scientific rationale, and short and long-term objectives. The basic objectives of project data management are: to maximize the consistency of data collected throughout the project by ensuring that data is documented to an agreed standard and that sufficient information is available to assess the quality and limitations of the data; to facilitate data and information

exchange within the project to maximize the use of the data during the course of the project; to ensure the longevity and multiple re-use of the data as a coherent data set.

Data management considerations must be applied before the field collection of data and must constitute a part of a scientific plan. An important purpose of the data management plan is to provide adequate metadata to ensure that a full and well-documented history is maintained. This is essential if future users of the data are to take full benefit of the data sets and for the funding agencies to ensure that, their investment is profitable.

To achieve a successful implementation of the data management plan there is a need for a developed data management infrastructure with clearly identified terms of reference for each component. Although there are a few institutions in the country involved in marine data collection there are none that have experience in ocean data processing and management. The conclusion of the status of marine data in Bahrain is that several reports contain data that "are in many ways too fragmented" and large volumes of available data have already been lost or are at risk of being lost.

The increasing emphasis on marine and coastal activities and development around Bahrain provides considerable opportunities for creating the necessary data collection and management infrastructure to respond to the national and regional needs.

The priority issues, which need to be resolved before an effective data and information structure can be put in place, include the nomination of the IODE national coordinator and the development of the inventory of national data holdings.

The responsibilities of the IODE national coordinator will include keeping the national institutions informed of the IODE activities on data and information management procedures developed within the IODE system, to facilitate the participation of the country in international data exchange and IODE projects, and to advise IODE on national needs and ways to help Bahrain in meeting them.

The creation of an inventory of available data holdings is necessary for all types of marine data. In this regard it is recommended that the experience gained by the IOC in the development of MEDI be used, and requested IOC to provide Bahrain with the MEDI catalogue and entry forms for information compilation and formatting. It is expected that a national inventory when developed would become available to the international community.

The most appropriate option for the future data management scheme in Bahrain would be a distributed data management service. Under this arrangement, each institution, which is involved today in marine data collection, will make its own inventory and will develop databases in accordance with the IODE procedures. IOC was asked to provide advice in this regard by submission of the necessary methodological publications and software. It is further recommended that a central facility for the development of national data archive could be at Environmental Monitoring Section (EMS) belonging to GDEWP.

The collection, management and dissemination of marine data requires coordination multiplied by a good will to ensure the effective and efficient operation of an archiving centre. There will be a need for a special national legal regulation by which all marine data collectors in the country will be requested to provide data to the central archive. In their turn Bahrain databases will be available to the data contributors openly and free of charge.

It is the responsibility of the collecting agencies to ensure that the collected data is managed and documented to the required standards identified by the national policy. Funding sources may be used as a mechanism to overcome a reluctance in data submission to a central

facility, by linking data submissions to the budget process, individual scientists and institutions will accept the responsibility for data submission.

It is recommended that while creating a data archive all possible sources of acquiring data for the area of interest should be explored, e.g. the availability of data in the centres of the IODE system, and data from foreign research vessels operating within the Bahrain EEZ. Data from the IODE system can be obtained by using procedures described in the IODE manual. For foreign vessels it should be a condition that any proposal to undertake work in the EEZ include a section on data collection and the submission of data to EMS.

It is recommended that both the marine resources and environment libraries require some additional resources to improve their ability to service the needs of their users. It is recommended that a professional librarian be appointed, and that efforts be made to update the books and journals, and to subscribe online of Aquatic Sciences and Fisheries Abstracts or other relevant aquatic since Internet access and the availability of the World Wide Web (WWW) is served at both agencies.

It would be most advisable to have a special coordination body to bring together the efforts of all institutions, which will be carrying out marine data collection and management. The NES team which has been established and which is operating under the EMS may be used as a prototype. Through evolution the coordination body may become a National Oceanographic Committee. It is recommended that the IODE National Coordinator should be a full member of the coordination body.

### 2.2. Bangladesh

The geographical condition of Bangladesh is in the prominent track of maritime monsoon wind just along the narrowest funnel shaped and shallow part of the Bay of Bengal in the South and the lofty Himalayas in the North. It is a part of humid tropics.

Geologically, it is the delta of the three big rivers of the world - the Ganges, the Brahmaputra and the Meghna, known as the Bengal Basin. The majority of the coastal area, however, consists of Holocene alluvial and estuarine deposits. The river systems continue a huge amount of sediment supply at the rate of 2.4 billion tons of sediment to one of the largest deltas of the world, keeping the expansion of the delta in progress. But it is very slow as most of this huge sediment supply washed away to the deeper part of the Bay of Bengal where it settles. It is believed that a delicate equilibrium exists between the upbuilding of the flood plain by flood lain deposits and the relative sea -level rise. A highly important and often disastrous feature is the extremely dynamic behaviour of the beds of the rivers and the tidal channels of the delta.

The tide in Bangladesh is semi-diurnal. The two successive levels of high water and low water show distinct daily inequalities. The South-west monsoon tends to accumulate water in the north-eastern corner of the Bay of Bengal. Together with the huge fresh water discharge from the large rivers, this leads to rise of the water level along the coast. It is most common and of the greatest magnitude during tides. Occasionally, the vertical appearing wall of water is about 1.0 m to 1.5 m in height, which under some adverse meteorological conditions produces tidal bore of up to 5 m in height and savages/damages the coastal regions of Bangladesh in a greater extent. The coastal waves have an important influence on the erosion and deposition processes. Along the 742 km long sandy coast of Bangladesh, this phenomenon is causing the well-known littoral drift. Incidentally, higher waves may occur during cyclones.

Both suspended and bed loads are moving with the water of the rivers and estuarine inlets. In the coastal regions of Bangladesh, the water is always found in motion due to tides

and waves which create turbulence. As a result, the settlement of moving sediments is found minimum in comparison to the huge quantities discharged by the river systems of Bangladesh.

Bangladesh organizations – Inland Water Transport Authority, two sea ports, Water Development Board, Hydrographic Department of Navy, Petroleum corporation, Fisheries Development Corporation, Atomic Energy Commission etc. are collecting hydrographic data and information according to their needs for their respective organizations from the Bay of Bengal. But, they need deep sea survey vessel, modern facilities and equipment to carry out their surveys smoothly. Two interesting features exist in the Bay of Bengal - (a) the biggest deep – sea Fan of the world - 3000 km long and 1000 km wide (b) the Swatch of No Ground – which connects continental shelf with the Indian ocean and thus transport the largest portion of 2.4 billion tons of sediment load that discharge by the three big rivers of the world to the Bay of Bengal. The above two features highlight the importance of carrying out frequent hydrographic survey in the Bay of Bengal.

There is no central body of collecting those acquired data of different organizations for processing, preservation and publication. National Oceanographic Data Centre (NODC) should form for those works under National Oceanographic and Maritime Institute (NOAMI) as NOAMI is the focal point for oceanographic research activities for the country which is recognized by the Government. of Bangladesh. Over the last 26 years, NOAMI has been carrying out work in promoting ocean sciences through holding of conferences, seminars and symposia at the international, regional and national levels. So, IOC of UNESCO should help Bangladesh to build a NODC equipped with modern facilities.

### 2.3. India (NIO)

Indian Oceanographic Data Centre (IODC) at NIO is one of the NODC established in 1964 as National facility for oceanographic/marine data & information management. IODC services was further elevated to RNODC for Indian Ocean by IOC/IODE in 1996 . IODC holding marine data for more than 80,000 stations collected during various expeditions /projects in the Indian Ocean since 1904. IODC has been developed 45 database tables for managing 36 oceanographic /marine parameters. Historical hydrographic, chemical and Argo float profiles for the Indian ocean are available over the internet for operational research work URL:(http://www.indianocean.org/support/main.htm, http://www.incois.gov.in/Incois/argo ) IODC also developed value added data products such as Atlases, CD-ROMs, etc.

Enormous amount of marine data / information have been generated by various research, academic, survey, and defence institutes at national level, in order to manage data /information, Department of Ocean Development (DOD) has established 14 National Marine Data Centres (NMDCs), in 1994 and a new autonomous centre called ' Indian National Centre for Ocean Information Services' (INCOIS), in 1999, under Ocean Information Services (OIS).

An attempt is made to assess data/ information available in public domain. The result shows that more then 60% of oceanographic data/information is being available in public domain from oceanographic observational programs. The rest is either lost or partially available in publications .The reasons are many for loosing data /information, but these are mainly due to: (i) Data management component is missing in project proposal/ observational programs ,(ii) Observational programs are not well linked with data management activities , (iii) There are communication gapes between data collectors (Scientists) and data managers and (iv) Funding agencies are not monitoring data flow from data generating agencies to the national data centers / archives. Therefore, the national oceanographic data acquisition network is partially fails to trace/ monitor data flow effectively.

## 2.4. Islamic Republic of Iran

Due to the need for data & information management in Iran, the establishment of a NODC in Iran was adopted through the resolution 153 in the 27th session of UNESCO General Conference.

In response to this resolution, a feasibility study mission was conducted in Iran in 1994. In 1995, IRODC was established in INCO and introduced as the node of IODE in Iran. It is the only NODC in the Persian Gulf region.

The most important activities of IRODC in the past few years are:

- IRODC has close working relations with other Iranian marine organizations such as: Meteorological org, Ministry of energy, National cartographic center, and Port & shipping org,… in relation to Data and Information Management;
- Producing metadata and cruise summary report which are accessible through the INCO's website;
- Preparing database;
- Establishment of an ***Oceanographic Database Management System*** (Designing Phase);
- Development **a system for generating calibrated SST maps in Persian Gulf**, using NOAA-AVHRR and MODIS images (Designing Phase);
- Establishment of ***Argo Portal*** and ***GCRMN*** websites;
- Organizing national training courses and workshops related to the oceanographic data and information management;
- Organizing regional training courses related to the oceanographic data and information management;
- Participating in visiting fellowships for Oceanographic Observations - Data Management;
- Preparing the ***RNODC-PG*** **(Persian Gulf)** proposal;
- Preparing the ***ODINCINDIO*** proposal;
- Proposing ***"Data Exchange Policy in INCO"*** *and "****Data Exchange Policy in National Level****"*;
- Promoting the IODE activities such as Ocean Teacher, Ocean Expert, Ocean Portal at the national level

Besides IRODC, other marine related organizations in Iran such as Department of Environment (DOE), National Cartographic Center (NCC), Geological Survey of Iran (GSI), I. R. Iran Meteorological Organization (IRIMO), Iran Space Agency (ISA), Ministry of Defense, Iranian Information & Documentation Center (Iran-doc), Port & Shipping Organization (PSO) and Iranian Fisheries and Research Organization (IFRO) also have been involved in marine data and information management. IRODC is trying to establish a coordinating system between the above mentioned organizations in term of DIM.

## 2.5. Kuwait

Meteorological data as well as oceanographic data for Kuwait are archived at different localities. Most of the meteorological data on Kuwait are monitored and kept by the Meteorological Service at Kuwait's International Airport. For the oceanographic data, Kuwait's Environment Public Authority (EPA is a monitoring agency in Kuwait) and Kuwait Institute for Scientific Research (KISR is research oriented) measure and store data at their premises since the 1970s.

At KISR, there are two integrated information systems, namely, EIS (Environment Information System) under NSTIC (National Science and Technology Information center), and EDMRAS (an integrated environmental data management, reporting and assessment

system). The above two systems include data concerning the marine, terrestrial, atmospheric and socio-economics.

Kuwait does not have a dedicated national oceanographic data center (NODC) yet, but will be interested in establishing one. Linkages with regional, and international systems are welcome.

### 2.6. Malaysia

The Division of Marine Meteorology and Oceanography was established in the Malaysian Meteorological Service (MMS) in 1975. Since then, the Division has been actively involved in marine weather forecasting activities in support of marine operations and building up a marine meteorological database. Marine data received from GTS is archived for a region bounded by latitude 5 °S – 20 °N and longitude 95 °E – 130 °E. Beside GTS, the Division also received logbooks data from Malaysian vessels under VOS Programme, oil rigs, platform, lighthouse and moored buoy. Quality control is performed on all the data before final archiving.

A moored buoy installed by MMS has been in operation since October 2003, sending data to MMS hourly through ORBCOMM satellite communication. These data will be made available to others through GTS. Currently, MMS is in the process of installing 5 port stations (wind, air temperature, pressure, rainfall, wave, sea surface current, water level and sea surface temperature) and 10 coastal stations (wind, air temperature and rainfall). This project is expected to be completed in Nov 2004.

### 2.7. Oman

The Sultanate of Oman has an extensive coastline of 3165km comprising the Gulf of Oman from Musandam peninsula to Ras Al-Hadd, and the Arabian Sea region which extends from Ras Al-Hadd to Salala in the south of the country.

The inter-annual circulation in the Omani waters is governed by the monsoonal winds i.e. North East Monsoon (NE) from October to March and the South West Monsoon (SW) from April to September. The country policy towards diversifying the national income resources has put the fisheries sector as the second national income resource. It is apparent that despite the significant effort from the governmental sectors to maintain long-term sustainable fisheries stocks, the absence of oceanographic data and information to achieve this goal is very obvious. Without fisheries oceanographic information, success in managing the population size and fisheries stocks will prove to be an elusive goal.

Unlike the Gulf of Oman, which is poorly investigated, the Arabian Sea has experienced several expeditions (JGOFS program and other) in the past, however there is still a number of drawbacks such as the lack of long term (time series) coastal water data in the country and the difficulties in accessing the available national data and information from international data centers. Therefore it is strongly recommended that the establishment of the NODC and NOIC should be given a high priority which will provide the access of oceanographic data and information necessary to maintain sustainable fisheries resources and will contribute to a much better understanding of the fate of different gases contributing to global warming. In the end such data and information will provide the foundation upon which enlightened management decisions on sustainable fisheries resources of the country can be built.

## 2.8. Saudi Arabia

The oceanographic studies in the Kingdom Saudi Arabia were first started at King AbdulAziz University (KAAU) in 1974 by establishing a department of oceanography within the activities of the Faculty of Science. In 1981, the department expanded and became the Faculty of Marine Sciences with four departments: Marine Physics, Marine Biology, Marine Chemistry and Marine Geology. Recently, a department of Maritime studies is added.

Presidency of Meteorology and Environment (PME) is the focal point for many international organizations related to oceanography. There are other ministries and national organizations involved in marine related work in the Kingdom of Saudi Arabia (e.g. KFUPM, NCWCD, SGS, SWCC,….). The laboratories at the Faculty of Marine Sciences (FMS) are fully equipped. The library has over 3000 books and related periodicals. Computing/Networking facilities and Internet are available.

The present available oceanographic data is mainly form the coastal area. These data are scattered because it has been obtained from various small projects. Therefore, establishing a National Oceanographic Data Centre (NODC) is recommended. Training programs and workshops with the cooperation of IOC/WMO is needed.

## 2.9. Sri Lanka

NODC-SL (National Oceanographic Data Center of Sri-Lanka), established in 1996 and came to the operation in 2000. It's belongs to Oceanography division of National Aquatic Resources Research and development Agency (NARA). The NARA is the research arm of Ministry of Fisheries and Aquatic Resources of Republic of Sri-Lanka.

Apart of NARA there are few organizations under Ministry of fisheries and aquatic Resources; Fisheries harbour corporation, Fisheries Corporation, Coast Conservation Department, and Department of Fisheries. NARA is having nine research division including Oceanography and thre three supporting division. The NODC-SL operates as a project in the Oceanography division. There are two personnel involving in NODC-SL, a research officer and research assistant. At present the research assistant post is vacant. It has separate space within the division 30'x20' and a server with workstation. NODC-SL runs own web page incorporating NARA's web site (http://www.nara.ac.lk/oceano.htm)

NODC-SL mainly arms with local data. Geological information in the continental self, Seal level and tidal data, comprehensive data sets of lagoons, biological and Physical data sets in the spotted areas are available in the NODC-SL. Those can obtain in soft and hard forms. Also detail bathemetric charts, few posters and maps are available in the NODC-SL. The Main users of NODC-SL are researches and students. On requests it provides information to industries and also to the private sector. NODC-SL having close contact with sister agencies under the Ministry of fisheries, Sri-Lanka NAVY, Universities, Research Organizations, Industries Private and Government. Past few years it has able build up MoUs with leading Oceanographic institution in the world; Scripps, Department of oceanography University of Gothenburg, University of Western Australia etc,. NODC-SL maintaining close contacts with RODC- National Institution of Oceanography Goa, Particular it has assisted to train personal on Data handling and interpretation.

NODC-SL needs more cadres to expand it activities and services. Also it expects equipment and trainings. Since Sri-Lanka located in a unique geographical location even in Oceanographic view (Western cost Arabian Sea, Eastern - cost Bay of Bengal, Southern - Indian Ocean), the data and information surrounding the island will be very useful for the region. Therefore it setup the vision to be great data center for the region and expecting from the region assistance to come up into that level.

## 2.10. Tanzania

Introduction

Tanzania is located in eastern Africa between the great lakes of Victoria to the north, Tanganyika to the west, and Nyasa to the southwest. To the northeast of Tanzania is located the highest point on the African continent which is Mount Kilimanjaro, and on the eastern side Tanzania borders the Indian ocean.

Ocean data and information management activities in Tanzania are coordinated by the Institute of Marine Sciences (IMS) which belongs to the University of Dar es Salaam. IMS was established in 1978 to be a lead institution in Tanzania in marine science and research. IMS was charge with the mandate of undertaking advanced marine science and research, providing advanced training in all marine related fields at graduate level and to provide consultancy services to public as well as private institutions/departments.

In 1996 IMS was nominated by the Government of Tanzania as the Designated National Agency (DNA). With that status IMS has been participating in ODINAFRICA since 1997 during the first phase which was know as ODINEA, representing Tanzania. So far two academic staff members have been trained as data managers and one administrative staff from the IMS library have been trained as information manager through the ODINAFRICA training programme.

Some issues, experiences and lessons

When IMS started to participate in ODINAFRICA there were several key issues that needed to be addressed. These included: (i) to have full internet connectivity, (ii) to have the basic equipment including software for data and information management, (iii) to have staff with the basic training, and (iv) to be accepted nationally as the DNA. Issues i-iii were swiftly implemented by IOC at project level. However, issue iv required local initiatives on the part of the participating institution at national level. This issue is the one around which activities of the data centre should revolve about.

Unfortunately, the first work plan for most of the participating institutions were over ambitious and poorly designed. As a result of this, after the first year most participating institution could not achieve much of their work plan. This situation poised a danger of demoralizing individuals involved in the project, particularly at national level. The situation was critically reviewed at the first annual workshop and a general plan of action was adopted. It was realized that it was almost impossible to win acceptability with empty hands. It was therefore decided that each participating institution should create a metadatabase (to start with) and use it to convince stakeholder to support the project at local level. Following that, for Tanzania, IMS created a national Coastal and Marine Meta-database to make an impact to stakeholders. The meta-database consists of eight components which are: Institutions, Scientists, Coastal districts, GIS layers, MPAs, Software, Documents, Projects, and IMS Publications. It was designed and implemented in a user friendly manner aiming at an average user.

With the metadabase in hand, IMS started concerted efforts of campaigns to create awareness and visibility of ODINAFRICA and the DNA to all key stakeholders. This was done by (i) visiting key stakeholders to talk and demonstrate to them the metadatabase, (ii) making presentations of the metadatabase and other themes of data and information management at workshops/seminars/meetings, (iii) inline with the ODINAFRICA training we also started developing other awareness products such as brochures, leaflets etc, (iv) we also

started to create data products including data summaries and others and most of our products are GIS based, and (v) in 2000 we created the IMS/TzNODC (Tanzania National Oceanographic Data Centre) webpage and hooked the metadatabase online.

Further activities and events

Following the training in ODINAFRICA, since 2002 IMS is computerizing its library catalogue and the aim is to provide online reference search services. In December 2002 the Government of Tanzania upgraded the status of IMS to full National Oceanographic Data Centre (NODC). Following this we have established a National Oceanographic Committee to guide the functions of the TzNODC. Tanzania have adopted the distributed mode of data and information management whereby the data centre assists institutions/departments in creating databases of their data and information and ensuring their proper management. A good example for this is the Marine Protected Areas (MPAs) database which is managed and updated regularly by the Marine Parks and Reserves Unit and they just provide us the updated version for broadcasting on the internet. Furthermore, during ODINAFRICA-II we received various data from World Data Centres (WDCs) and we have already started to create data products out of them focusing the Tanzania EEZ. Tanzania continues to actively participate in ODINAFRICA-III.

Some key achievements

After a lot of efforts and hard work we started to make achievements and to be more acceptable nationally. Some of the good evidences for this are: (i) since 1999 IMS/TzNODC receives 2-3 undergraduate students from the department of computer science for practical training (for 8 weeks) in database design and management, (ii) IMS has been requested several times by different government departments and projects/programmes to train their staff in database development and concepts. So far we have trained staff from three government departments and two national projects, and (iii) TzNODC has also been requested several times to give special presentations in workshops/meetings.

Observations and recommendations

The IOCINDIO region has a lot of recourses and already a lot is/has being done related to ocean data and information management. What is needed is to create a regional framework which will guide and support the various such initiatives in the region (eg, ROPME), and that will also help to link with the international community. I believe that the proposed ODINCINDIO project has come at the very right time as the framework that is needed in this region, and I urge all countries in the region to support it. The ODINCINDIO may open up for more collaborative initiatives between and among regions, countries, institutions down to scientists' level. For instance, Tanzania has had close relationship with some of the countries in this region for the past 200 years. Areas of mutual interest could easily be developed.

Finally, in developing the ODINCINDIO project and later during its implementation it is important to note the following: (i) ensure there is a provision for awareness creation in the project and work plans. This is a very important aspect for the success of the project that should not be ignored. (ii) it is important to develop realistic work plans that you can implement. Do not be over ambitious because that may affect the morale of the project. (iii) ensure that there is close collaboration between data and information managers because the two areas intersect (overlap to each other) greatly, and are never mutually exclusive. They always go together.

### 2.11. Mauritius

The National Oceanographic Data and Information Centre of Mauritius (MNODC) was set up in November 1999 within the framework of Ocean Data and Information Network for Africa (ODINAFRICA). This project is funded by the Government of Flanders through the Inter-Governmental Oceanographic Commission (IOC of UNESCO).

The key issues needed to be addressed were coastal erosion, management of key ecosystems and habitats, tourism, marine pollution, natural cataclysms such as cyclones, freak waves, tsunamis, flood, sea-level rise and climate change.

With the support of the ODINAFRICA programme, the MNODC has improved its infrastructure as well as its capacity in Data and Information Management through regular training courses, permanent help desk, internships and attachments. The Ocean Teacher has been a very useful tool towards the MNODC achievements.

Taking into account the multidisciplinary nature of oceanography, various local institutions had been involved in ocean data collection and archival. The MNODC has provided a platform for effective coordination among the marine stakeholders and consequently contributes to the socio-economic development of Mauritius by acquiring knowledge to assemble, manage, archive and disseminate data and derived products to research scientists and policy makers.

The MNODC has thus compiled a database comprising of all data in its area of interest from the World Data Centres and enriched those with the locally available data. It has also established a networking at the local as well as regional levels with fast Internet access.

To maintain its progress and commitments, as a credible institution, the MNODC requires the followings: (i) equipment support; (ii) advanced training in data and information management; (III) access to high resolution remote sensing data, manipulation and its interpretation; (IV) Marine Atlas of its area of Interest; (V) awareness campaign; (VI) support to generate its own data; (VII) collaboration with regional and international projects such as IODE, IOGOOS, IMAP, WIOMAP, ARGO, MSG, EUMETSAT, NOAA, GCRMP, etc.

## 3. REPORT ON SURVEY ON AVAILABLE DATA AND INFORMATION MANAGEMENT FACILITIES IN IOCINDIO COUNTRIES

Dr. Vladimir Vladymyrov (Head, IODE Project Office) informed the meeting that according to recommendations of the First Conference of the Indian Ocean Global Observing System (IOGOOS), IOC has undertaken a survey in 2003 to identify and document, in detail, all existing ocean data management facilities in the region to enable identification of suitable data and information management partners able to handle all relevant data types and develop the required data products and services. The survey was distributed to all IOC member states in the Indian Ocean Region and it was used to assess the data management capacity building capabilities of the Region. The survey results were collated and presented at the IOGOOS Workshop on Capacity Building and Strategy for Ocean Data and Information Management in Indian Ocean Region held in Hyderabad, India, in December 2003. Unfortunately, only 10 responses were received for this survey from 7 countries.

Taking into account that data and information management will be an essential and critical component of IOGOOS, it was decided to undertake a second survey that will cover all IOGOOS member countries and also focus on information (marine library) management.

Based upon the results of this survey, capacity building activities will be planned through, inter alia, the development of ODINCINDIO.

The second survey has been undertaken in the region in April – June 2004. Fourteen responses were received from 13 countries, 7 from them are the IOCINDIO countries (Australia, India – 2 responses, Iran, Maldives, Reunion (France), Sri Lanka, Pakistan). All responses contain Data Management related information and only 2 of them contain Information Management information (India – NIO, and Maldives).

The results of the survey for the IOCINDIO countries can be summarised as follows. Out of these 7 countries, 6 countries have established National Oceanographic data centers (NODC). Two of them (Australia and India) have been established in 1964, others – in 1981-1996. Maldives has not established NODC. India and Maldives have the Marine Information management centres. All data centres have Internet access which range from 56Kps dial-up connection to 10Mbps permanent connection (Sri Lanka did not provide information on the Internet connection). All NODC have their Web pages. Staff of the NODCs is from 1 to 16 persons. Staff of the MIM centres is from 4 to 8 persons. All data centres provide services for uses and produce data products. Three NODC (Australia, France, and Sri Lanka) work with both delayed mode and operational data and three of them (India, Iran, Pakistan) work with the delayed mode data only (India has another centre working with operational data).

The data centre requirements identified in the survey include (i) an international project to enhance and coordinate data management activities in the region, (ii) IODE guidance on data and metadata standards, (iii) increased internet bandwidth, (iv) computer equipment and software, (v) real-time data capability, including access to GTS, (vi) involvement in regional/international programmes and projects, and (vii) technical and financial support to establish NODC. The staff requirements identified in the survey include (i) training and advanced training in oceanographic data management, (ii) more staff, including permanent staff, (iv) internships and attachment to other well established NODC.

Only one IOCINDIO country (Malaysia) that has established NODC did not sent the response on the survey. However, 10 countries that do not have the NODC (Bangladesh, Indonesia, Iraq, Kuwait, Myanmar, Oman, Qatar, Saudi Arabia, Thailand, UAE) and that probably hardly require the capacity building did not send the response. That is why, the detailed analysis of the regional requirements can only be done at this meeting where most IOCINDIO countries present.

As it was mentioned before, only 2 responses contain Information management information (India – NIO, and Maldives). It is too small amount to analyze, however, it is clear that IM component in the region needs in serious improvement.

## 4. SURVEY TO ASSIST WITH THE DISCUSSIONS TOWARDS THE DRAFTING OF THE ODINCINDIO PROJECT DOCUMENT

In order to correctly assess the requirements for data and information capacity and data and information products and services, participants were requested to fill a short survey (included as Annex II). The results of this survey are included as Annex III. The results can be summarized as follows:

- there is a need and wish to establish national oceanographic committees;
- there is a need and wish to establish national oceanographic data and information centres;
- there is a need for assistance with the establishment of national oceanographic data and information centres;

- some countries wish to establish centralized facilities, whereas others prefer a distributed architecture;
- there is a need for capacity building in data and information management both at the basic and advanced level;
- there is a need to repatriate data that have been collected by other countries in the waters of the participating countries;
- there is a need and wish to develop national as well as regional metadata system;
- there is a need and wish to develop online data services;
- the majority of participating countries is currently not applying the IOC policy on oceanographic data exchange;
- there is a need to provide the ASFA bibliographic database system to half of the participating institutions;
- there is a need and wish to develop a national as well as regional online directory of marine experts;
- there is a need and wish to develop a national as well as regional online catalogue of library holdings;
- there is a need and wish to develop a national as well as regional online electronic repository of indigenous publications.

The results of the survey were subsequently taken into consideration in the revision of the ODINCINDIO Project Document.

## 5. ODINCINDIO PROJECT DOCUMENT

The meeting then reviewed the draft "Proposal for the establishment of the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO)" prepared by Dr. Zaker and reviewed by Dr Radhakrishnan (IOGOOS Chair), Mr. Bill Erb (Head, GOOS Project Office Perth) and Mr Peter Pissierssens (Head, Ocean Services Section IOC). The Document had been distributed to all participants prior to the meeting.

The meeting revised the Document that shall now be entitled "Project Document for the Establishment of the Ocean Data and Information Network for the Central Indian Ocean region (ODINCINDIO)".

The meeting adopted the revised Document which is included in this report as Annex IV.

The meeting recommended that the work plan be sent to all participating countries requesting them to identify activities for which financial support is required. The meeting called on participating countries to be pragmatic in this regard as external funding will be limited. The meeting recommended that, based upon information received from the participating countries, an updated version of the project document, with detailed budget requirements, be prepared for consideration and approval by IOCINDIO-IV (early 2005), IODE-XVIII (26-30 April 2005), IOC-XXIII (June 2005) and relevant ROPME meetings with the view of starting fund requiring activities as soon as possible in 2005 as detailed in the work plan.

The meeting further called on IOC and ROPME to continue efforts to involve all IOCINDIO countries in the project. The meeting called on countries in the region, that are currently not IOC Member States, to join IOC as soon as possible.

As the First Session of the ODINCINDIO Steering Committee will not take place until 2005 and the project should be commenced as soon as possible, the Workshop

nominated Dr. Nasser H. Zaker as *ad interim* ODINCINDIO Project Coordinator and that the *ad interim* ODINCINDIO Project Office will be hosted by INCO.

This temporary arrangement will not exclude the nominated individual and institution from applying for the same position, to be decided upon during the First Session of the ODINCINDIO Steering Committee.

The workshop recommended that the First Session of the ODINCINDIO Project Steering Committee be held in 2005. Venue and dates will be agreed upon later.

## 6. CLOSING

The meeting was closed on 5 October 2004. In his closing remarks Dr. Nasser Hadjizadeh Zaker said that it is his great pleasure and honour that during the last 4 days INCO hosted the meeting participants at INCO and that he is very glad that the ODINCINDIO Planning meeting was highly successful and valuable results were achieved. From the excellent national reports a better understanding of DIM capacities and needs in the region was reached and the ODINCINDIO proposal was discussed and revised carefully.

It is very important that ODINCINDIO is proposed in a time that all the countries in the region have reached to the point that marine data and information management and exchange is so important and this awareness certainly will help successful progress of the project. This meeting was an opportunity for a better familiarization of the scientists in the region and it is for sure that with ODINCINDIO there will be a closer cooperation among the Indian Ocean Rim in the future.

At the end of his speech he thanked IOC (IOCINDIO, IODE, and IOGOOS) and ROPME for their valuable support for holding this meeting. He highly appreciated the trust for selecting him as the project coordinator of ODINCINDIO and INCO as the host for the project office.

Dr. Dr. Hassan Mohammadi, Acting Coordinator of ROPME, thanked INCO for offering to host the project office and congratulated Dr. Zaker for his nomination and selection as project coordinator wishing him all the success. He emphasized the need for training and networking as priority tasks to be attentively pursued in the ODINCINDIO project. He invited all ROPME Member States to actively participate in the project and carry out the assigned activities. He expressed hopes that with full cooperation and partnership of the stakeholders, the ODINCINDIO project would meet all the objectives.

Mr. Peter Pissierssens, Head of IOC's Ocean Services Section, thanked INCO for hospitality; hard working staff and excellent organization of the meeting.

He thanked IOGOOS for giving its support, and thanked the participants for their hard work during the meeting, He congratulated Dr. Nasser Hadjizadeh Zaker and underlined that Dr. Zaker: has worked hard to get this project going in the region.

He thanked ROPME for assistance and for their interest to be a partner in this endeavour Partnerships are very important. Cooperation and complementarity is sometimes difficult between agencies, be it international, regional or bilateral. Our cooperation with ROPME is exactly what we were hoping for: hands reaching out to work together.

We gave birth to a child and let's grow him up together.

**Annex I**

**AGENDA & TIMETABLE**

| Time | Saturday 2 Oct | Sunday 3 Oct | Monday 4 Oct | Tuesday 5 Oct |
|---|---|---|---|---|
| **09:00-10:30** | **09:30** Welcome & opening ceremony<br><br>(Dr. Zaker; Dr Abdin Saleh; Mr. Pissierssens; Dr. Mohammadi) | National reports<br><br>Report on survey on available data and information management facilities in IOCINDIO countries (V.Vladymyrov) | ODINCINDIO Project Document: review and discussion on planned activities | Adoption of report |
| **10:30-11:00** | **BREAK** | **BREAK** | **BREAK** | **BREAK** |
| **11:00-12:30** | National reports | Survey to assist with the discussions towards the drafting of the ODINCINDIO project document (P.Pissierssens) | ODINCINDIO Project Document: review and discussion on planned activities | Adoption of report<br><br>Closure |
| **12:30-14:00** | **LUNCH** | **LUNCH** | **LUNCH** | **LUNCH** |
| **14:00-15:15** | National reports | Analysis of the survey (P.Pissierssens)<br><br>ODINCINDIO Project Document: review and discussion of proposal | ODINCINDIO Project Document: management aspects | |
| **15:15-15:45** | **BREAK** | **BREAK** | **BREAK** | |
| **15:45-17:00** | National reports | ODINCINDIO Project Document: review and discussion of proposal | ODINCINDIO Project Document: management aspects | |

**ANNEX II**

**SURVEY TO ASSIST WITH DISCUSSIONS TOWARDS THE DRAFTING OF THE ODINCINDIO PROJECT DOCUMENT**

## 1. NATIONAL COORDINATION OF MARINE RESEARCH AND MONITORING

- Does your country have a national oceanographic committee that coordinates between all stakeholders that undertake research/monitoring activities in the marine environment : □ yes □ no
  If yes then provide details:

  If no then do you think such a committee would be useful: □ yes □ no

- Is there currently a link between the meteorological community/service and the oceanography research/monitoring community in your country: □ yes □ no
  If yes then detail:

  If no then should such a link be established: □ yes □ no

## 2. DATA CENTRE

- Does your country have one or more facilities for the management of oceanographic data

  - ❑ None
  - ❑ One
  - ❑ More than one

  **If your answer is 'One' or "more than one' then**

- is one of these an IODE NODC or DNA : □ yes □ no

  **If your answer is "more than one" then**

- is there a mechanism to coordinate work between the different data management facilities : □ yes □ no

  **If the answer is "none"":**

- Would you like to establish one : □ yes □ no

- Does your country need assistance with making the decision where to install the NODC (based upon requirements related to establishment of NODCs) : □ yes □ no

- Will you apply a centralized approach (1 data centre per country) or distributed model (with multiple centres involved in data management and the NODC playing a coordinating role)
  O centralized
  O distributed
  O don't know yet

## 3. DATA MANAGEMENT CAPACITY BUILDING

- Does your data centre (or the one that you wish to establish) require capacity building assistance: □ yes □ no

  If yes

- Do you require **hardware support** to establish a startup level data centre:
  □ yes □ no

  If yes then provide details:

- Do you require **hardware support** to improve an existing data centre:
  □ yes □ no
  If yes then provide details:

- Does your data centre staff require **basic training**: □ yes □ no

- Does your data centre staff require **advanced training**: □ yes □ no
  If yes then provide details:

- Do you need guidance on standards, formats and guidelines related to oceanographic data management ? □ yes □ no

## 4. DATA SERVICES

- Does your country **need access to data that were collected in your territorial waters** by other countries: □ yes □ no

- Does your data centre maintain a **metadata base**: □ yes □ no
  If no then would you like to develop one: □ yes □ no

- Does your data centre provide **data services online**: □ yes □ no
  If no then would you like to develop this service: □ yes □ no

- Does your data centre have a **permanent internet connection**: □ yes □ no
  If no then is there a need for this: □ yes □ no

- Does your data centre provide **data services** (online or otherwise) to users: □ yes □ no
  If yes then are these:
  - O **Free of charge**
  - O **For a fee**

- Does your data centre **restrict access** to certain date sets (reserved for certain users): □ yes □ no
  If yes then detail:

- Is your country applying the IOC oceanographic **data exchange policy**?
  □ yes □ no

## 5. NETWORKING

- Do you believe that it would be useful to develop a **regional metadatabase**:
  □ yes □ no

- Do you believe that it would be useful to develop a **regional ocean database system**:
  □ yes □ no

## 6. INFORMATION MANAGEMENT

- Does your country have one or more facilities for the management of oceanographic information (literature) = **national marine library/information centre**

  - ❑ None
  - ❑ One
  - ❑ More than one

  **If the answer is "none"":**

- Would you like to establish one : □ yes □ no

- Does your country need assistance with **making the decision** where to install a national marine library/information centre (based upon requirements related to establishment of national marine library/information centre): □ yes □ no

## 7. INFORMATION MANAGEMENT CAPACITY BUILDING

- Does your national marine library/information centre (or the one that you wish to establish) **require capacity building assistance**: □ yes □ no

  If yes

- Do you require **hardware support** to establish a startup level national marine library/information centre :
  □ yes □ no

  If yes then provide details:

- Do you require **hardware support** to improve an existing national marine library/information centre :
  □ yes □ no
  If yes then provide details:

- Does your national marine library/information centre staff require **basic training**: □ yes □ no

- Does your national marine library/information centre staff require **advanced training**: □ yes □ no
  If yes then provide details:

- Do you need guidance on standards, formats and guidelines related to oceanographic information management ? □ yes □ no

## 8. INFORMATION SERVICES

- Does your national marine library/information centre have a **subscription to ASFA**: O yes O no

If yes then is this a subscription to:
- The printed version
- The CD-ROM version
- The Internet version

If no then does your national marine library/information centre need ASFA:
O yes O no

- Does your national marine library/information centre have **subscriptions to all the core journals** required to fulfull the needs of its users: O yes O no

- Does your country have a **national directory of marine professionals**:
O yes O no
If no then would it be useful to develop: O yes O no

- Does your national marine library/information centre have a **bibliographic holdings database**: O yes O no
If no then would you like to develop this services: O yes O no
If yes then is it accessible online: O yes O no
If no then would you like to develop this service: O yes O no

- Does your country maintain a **database of scientific publications produced by national experts**: □ yes □ no
If no then would you like to develop one: □ yes □ no
If yes then is this a bibliographic or full text system (repository):
O bibliographic only
O full-text repository
If not full text e-repository then would you like to develop it: □ yes □ no

9. ODINCINDIO coordination and management

- Should ODINCINDIO have a project management, monitoring and coordination office?

O yes O no

**10. Other requirements**

Can you identify any other requirements that ODINCINDIO should focus on (describe)

## ANNEX III

## RESULTS OF THE SURVEY TO ASSIST WITH DISCUSSIONS TOWARDS THE DRAFTING OF THE ODINCINDIO PROJECT DOCUMENT

| Topic | Bahrain | Bangladesh | Kuwait | Malaysia | Oman | Saudi Arabia | Sri Lanka | India NIO | India INCOIS | Iran |
|---|---|---|---|---|---|---|---|---|---|---|
| **NATIONAL COORDINATION** | | | | | | | | | | |
| Do you have national oceanographic committee? | **NO** | **NO** | **NO** | YES | **NO** | **NO** | YES | YES | YES | YES |
| If no: would it be useful? | **YES** | **YES** | **YES** | - | **YES** | - | | | - | |
| Is there a link between meteo and oceano community? | **NO** | YES | **NO** | YES | YES | **NO** | **NO** | YES | YES | YES |
| If no: should there be a link? | **YES** | - | **YES** | - | | - | **YES** | | - | |
| **DATA CENTRE** | | | | | | | | | | |
| Do you have 1 or more facilities for ocean data man.? | **NONE** | >1 | **NONE** | >1 | >1 | **NONE** | 1 | >1 | >1 | >1 |
| if yes: is one of them an NODC/DNA? | | **NO** | | YES | **NO** | - | YES | YES | YES | YES |
| if yes: is there a mechanism to coordinate? | | - | | YES | **NO** | - | - | YES | YES | **NO** |
| If no data centres then is there need to establish one? | **YES** | **YES** | **YES** | | **YES** | - | - | | - | - |
| Is there need for assistance with establishment? | **YES** | **YES** | **YES** | | **YES** | ??? | - | - | NO | NO |
| Will you use centralized or distributed approach? | DISTR | CENTR | CENTR | DISTR | UNKN | - | CENTR | DISTR | DISTR | to be agreed |
| **DATA MGMT CAP. BUILDING** | | | | | | | | | | |
| Data your data centre need assistence? | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | YES | NO | **YES** | **YES** |
| Is hardware needed to establish a data centre? | NO | **YES** | **YES** | NO | **YES** | **YES** | **YES** | NO | NO | NO |
| Is hardware needed to improve a data centre? | - | **YES** | **YES** | NO | | - | **YES** | NO | NO | NO |
| Is basic training needed? | **YES** | **YES** | **YES** | **YES** | **YES** | - | **YES** | NO | NO | NO |
| | | | | | | | | | | |

| Topic | Bahrain | Bangladesh | Kuwait | Malaysia | Oman | Saudi Arabia | Sri Lanka | India NIO | India INCOIS | Iran |
|---|---|---|---|---|---|---|---|---|---|---|
| Is advanced training needed? | - | **YES** | **YES** | **YES** | **YES** | - | **YES** | NO | **YES** | **YES** |
| Is guidance on standards needed? | YES | **YES** | **YES** | **YES** | **YES** | - | **YES** | NO | **YES** | NO |
| **DATA SERVICES** | | | | | | | | | | |
| Is access to data collected by others in yr EEZ needed? | UNKN | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |
| Do you maintain a Metadatabase? | NO | YES | YES BUT | YES | NO | - | NO | YES | YES | YES |
| If no: Would you like to develop it? | **YES** | | **YES** | | **YES** | - | **YES** | | - | |
| Do you have Data services on-line? | NO | NO | YES | NO | NO | - | NO | YES | YES | NO |
| If no: Would you like to develop this? | **YES** | **YES** | - | **YES** | **YES** | - | **YES** | | - | **YES** |
| Do you have a permanent Internet connection? | YES | YES | YES | YES | Will have | - | YES | YES | YES | YES |
| If no: Is there a need for it? | | **YES** | | | **no** | - | - | | - | |
| Are data services free or at a charge? | NO | CHARGE | BOTH | BOTH | | - | FREE | BOTH | FREE | FREE |
| Do you restrict access to certain data? | - | YES | YES | YES | | - | YES | YES | YES | YES |
| Do you apply IOC data exchange policy? | **NO** | YES | **NO** | - | UNKN | - | **NO** | **NO** | **NO** | YES |
| **NETWORKING** | | | | | | | | | | |
| Should there be a Regional metadatabase system? | **YES** | **YES** | **YES** | **YES** | **YES** | - | **YES** | **YES** | **YES** | **YES** |
| Should there be a Regional database system? | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |
| **INFORMATION MANAGEMENT** | | | | | | | | | | |
| Do you have 1 or more facilities for ocean info man.? | NONE | >1 | 1 | >1 | >1 | >1 | 1 | >1 | >1 | >1 |
| If no info centres then would you like to establish one? | **YES** | - | - | - | | | - | - | - | |
| Do you need decision assistance on est. IM centre? | **YES** | **YES** | NO | NO | **YES** | - | - | NO | NO | NO |
| | | | | | | | | | | |

| Topic | Bahrain | Bangladesh | Kuwait | Malaysia | Oman | Saudi Arabia | Sri Lanka | India NIO | India INCOIS | Iran |
|---|---|---|---|---|---|---|---|---|---|---|
| **INF.MGMT CAP.BUILDING** | | | | | | | | | | |
| Do you Require IM capacity building? | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | - | NO | **YES** | **YES** |
| Is hardware needed to establish the info centre? | NO | **YES** | NO | NO | **YES** | - | - | NO | NO | NO |
| Is hardware needed to improve the info centre? | NO | **YES** | NO | NO | **YES** | - | **YES** | NO | NO | NO |
| Is basic training needed? | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | NO | NO | NO |
| Is advanced training needed? | - | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |
| Is guidance on standards needed? | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | NO | **YES** | **YES** |
| **INFORMATION SERVICES** | | | | | | | | | | |
| Does natl marine library have ASFA subscription? | NO | - | YES | ??? | YES | NO | NO | YES | NO | YES |
| if yes: Printed version? | | - | - | | - | | | - | - | - |
| if yes: CD-ROM version? | | - | YES | | YES | | | YES | - | YES |
| if yes: Internet version? | | - | - | | - | | | YES | - | - |
| If no: do you need ASFA? | **YES** | - | - | - | - | **YES** | **YES** | - | **YES** | - |
| Do you have subscription to all core journals? | **NO** | - | YES | **NO** | **NO** | **NO** | **NO** | YES | YES | **NO** |
| Is there National directory of experts? | NO | NO | yes but | YES | NO | NO | NO | YES | YES | NO |
| If no: need to develop? | **YES** | **YES** | | | **YES** | **YES** | **YES** | | - | **YES** |
| Is there library catalogue database? | NO | NO | YES | YES | ??? | - | YES | YES | YES | YES |
| If no: need to develop? | **YES** | **YES** | - | | - | - | - | | - | |
| If yes: available online? | - | - | YES | **NO** | - | - | - | - | **NO** | **NO** |
| Is there Database of indigenous scientific publications? | YES | YES | YES | YES | YES | NO | YES | YES | YES | YES |
| If no: Would you like to develop? | | - | | | | **YES** | - | - | - | |
| If yes: is it full text e-repository)? | NO | NO | NO | ??? | NO | ??? | NO | NO | NO | NO |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| If no: would you like to develop an e-repository? | **YES** | **YES** | **YES** | ??? | **YES** | ??? | **YES** | **YES** | **YES** | **YES** |
| Topic | Bahrain | Bangladesh | Kuwait | Malaysia | Oman | Saudi Arabia | Sri Lanka | India NIO | India INCOIS | Iran |
| **ODINCINDIO COORDINATION** | | | | | | | | | | |
| Need for office? | **YES** | **YES** | **YES** | **-** | **YES** | **-** | **YES** | **YES** | **YES** | **YES** |
| | | | | | | | | | | |

???: information not available at this moment

**ANNEX IV**

# PROJECT DOCUMENT FOR THE ESTABLISHMENT OF THE OCEAN DATA AND INFORMATION NETWORK FOR THE CENTRAL INDIAN OCEAN REGION (ODINCINDIO)

## 1. INTRODUCTION

The IOC's International Oceanographic Data and Information Exchange (IODE) is established to enhance marine research, exploitation and development by facilitating the exchange of oceanographic data and information between participating Member States and by meeting the needs of users for data and information products. The main objectives of the IODE Programme are: (i) to facilitate and promote the exchange of oceanographic data and information; (ii) to develop standards, formats, and methods for the global exchange of oceanographic data and information; (iii) to assist Member States to acquire the necessary capacity to manage oceanographic data and information and become partners in the IODE network; (iv) to support international scientific and operational oceanographic programmes of IOC and WMO and their sponsor organizations with advice and data management services.

Recognising that the lives of at least 1.5 Billion people are profoundly influenced by the Indian Ocean and considering that many Indian Ocean rim countries depend to a large extent on marine and coastal resources, the ability to acquire, manage, archive and disseminate data, as well as the capacity to generate information in support of decision making and management of the Oceans and Coastal Zones is of vital importance. The Ocean Data and Information Network for the Central Indian Ocean Region (ODINCINDIO) Project responds to these needs through: (i) providing assistance in the development, operation and strengthening of National Oceanographic Data (and Information) Centres and to establish their networking in the region; (ii) providing training and education in *marine data and information management*, taking into account the requirements of operational oceanography)*;* applying standard formats and methodologies as defined by the IODE; (iii) enhancing national and regional awareness for Marine Data and Information Management; (iv) assisting in the development and maintenance of national and regional marine data, metadata and information databases; (v) assisting in the development and dissemination of marine data and information products, catering to the needs of user communities at the national and regional levels, and responding to national and regional priorities; (vi) undertaking the ODINCINDIO activities in close collaboration and networking with other relevant organizations, programmes and projects operating in the region; and (vii) undertaking the above activities in close collaboration and networking with international projects and programmes operating in the Indian Ocean and Persian Gulf region.

In addition, ODINCINDIO will satisfy the requirements of the other IOC programmes (e.g. IOGOOS), as well as other organizations, programmes and projects active in the region (eg ROPME), in terms of capacity building, and management and exchange of oceanographic data and information.

Development and implementation of the ODINCINDIO project will be based on the success and lessons learnt from the other IODE ODIN projects, in particular, ODINAFRICA and ODINCARSA (Caribbean and South America region). First the ODIN idea was implemented in the IOCINCWIO region as from 1996 when the IOC, with funding from the Government of Flanders, started the development of the Ocean Data and Information Network for Eastern Africa (ODINEA). This was in fact a follow-up to the RECOSCIX-WIO (Regional Cooperation in Scientific Information Exchange in the Western Indian Ocean region) and RECOSCIX-CEA (Regional Cooperation in Scientific Information Exchange in

the Central Eastern Atlantic region) projects. The innovative model of these projects was the linking of provision of equipment, training and operation support in a regional context. The ODIN projects focus on building capacity at the national level and the development of products and services at the national and regional scale. Training courses are organized at the regional level and follow-up support by a training consultant is provided. ODIN networks have been developed in Africa (ODINEA, ODINAFRICA), Caribbean and South America (ODINCARSA). It is worth noting that all ODIN networks are now being developed in close collaboration with GOOS (and other programmes). An excellent example is ODINAFRICA III, which has been developed as a cross-cutting project involving data collection (GOOS), data and information management (IODE), and product/service development (GOOS, ICAM).

The ODINCINDIO proposal was discussed in detail during the IOGOOS Workshop "Capacity Building and Strategy for Ocean Data and Information Management", held in Hyderabad, India, between 8 and 10 December 2003. The meeting stated that "*ODINCINDIO should be the capacity building instrument for IOGOOS*" and therefore recommended the establishment of ODINCINDIO.

The IOGOOS-II meeting (Colombo, Sri Lanka, 26-29 April 2004) "*acknowledged the results of the Hyderabad Meeting and endorsed its proposed work plan. The meeting recalled the importance of Capacity building as the basis for the achievements of IOGOOS objectives in terms of Data and Information Management and recognized the importance of ODINCINDIO as the Capacity Building Instrument for IOGOOS. The meeting noted that the ODINCINDIO planning meeting will b held in Tehran in August 2004*"

The Twelfth Meeting of the ROPME Council of Ministers (September 2003) decided on the establishment of a Regional Marine Data and Information System at the ROPME Secretariat. To this effect, a project proposal has been prepared and a survey has been carried out on regional capabilities and requirements for an ocean data and information system. The ROPME system will then be integrated with relevant international data and information systems, particularly those of IOC and UNEP. Such integration will be assured through proper liasison with the ODINCINDIO project aiming at well coordinated national, regional and international links and working relations within an effective framework of action.

## 2. PROJECT OBJECTIVES

**OBJECTIVE 1:** Provide assistance in the development, operation and strengthening of National Oceanographic Data (and Information) Centres and to establish their networking in the region;

**OBJECTIVE 2**: Provide training and education in *marine data and information management*, taking into account the requirements of operational oceanography)*;* applying standard formats and methodologies as defined by the IODE;

**OBJECTIVE 3**: Enhance national and regional awareness for Marine Data and Information Management;

**OBJECTIVE 4**: Assist in the development and maintenance of national and regional marine data, metadata and information databases;

**OBJECTIVE 5**: Assist in the development and dissemination of marine data and information products, catering to the needs of user communities at the national and regional levels, and responding to national and regional priorities;

**OBJECTIVE 6**: Undertake the ODINCINDIO activities in close collaboration and networking with other relevant organizations, programmes and projects operating in the region.

## 3. ACTIVITIES DESCRIPTION

The activity descriptions below are preliminary and can be modified by the Project Steering Committee.

**OBJECTIVE 1**

**1.1 Establishment of national oceanographic committees (including all ocean and coastal area stakeholders)**

- In order to ensure that all national stakeholders are fully involved in, and will benefit from the activities of the NODCs and NOICs it is recommended to establish a national oceanographic committee. This Committee will coordinate activities related to oceanography and coastal management, including data and information management. It is strongly recommended to include the meteorological services in this committee.

**1.2 Organization of advisory mission of IODE expert to member state to advise on establishment of national oceanographic data centre (NODC) and national oceanographic information centre (NOIC) – based upon relevant IOC Manuals and Guides**

- Upon request by the member state IOC can organize an advisory mission by an expert to assist in the selection process to identify suitable institutions to establish the NODC and NOIC. It is recommended that the cost of such mission be covered by the country.

**1.3 Meeting of national oceanographic committee to identify suitable host institutions for national oceanographic data centre (NODC) and national oceanographic information centre (NOIC) and identify their respective national coordinators; decide on distributed or centralized structure**

- The national oceanographic committee will make the decision on where to establish the NODC and NOIC guided by relevant IOC manuals and guides and, as applicable, the advice provided by the IODE expert (see 1.2). It is recommended that the cost of such mission be covered by the country.

**1.4: following response by IOC to letter prepared under 1.3: Formal establishment of NODC**

- In order to fully benefit from the IODE system and the project, Member States will be requested to formally establish NODCs as per IODE guidelines (these will be provided).

**1.4a: following response by IOC to letter prepared under 1.3: Formal establishment of NOIC**

- In order to fully benefit from the IODE system and the project, Member States will be requested to formally establish NOICs as per IODE guidelines (these will be provided). Note that the establishment of NOICs is subject to the adoption by the IODE Committee and IOC Assembly of such a structural element within the IODE network.

**1.5 organize regular meetings of national oceanographic committee (eg annual)**

- In order to ensure effective coordination it is recommended to organize at least annual meetings of the national oceanographic committee. It is recommended that the cost be covered by the country.

**1.6 Procurement of startup hardware/software NODC**

- Support can be provided for newly established NODCs. This will be a standard equipment and software package. A full description of configuration can be provided.

**1.7 Procurement of additional hardware/software NODC**

- Established NODCs can also apply for some additional hardware and software. This should be justified by a relevant document describing the planned use of the hardware/software.

**1.8 Procurement of startup hardware/software NOIC**

- Support can be provided for newly established NOICs. This will be a standard equipment and software package. A full description of configuration can be provided.

**1.9 Procurement of additional hardware/software NOIC**

- Established NODCs can also apply for some additional hardware and software. This should be justified by a relevant document describing the planned use of the hardware/software.

**1.10 Provision of operational support for startup NODC**

- Support can be provided for day-to-day operational expenses required to operate the NODC (telecom, Internet access, office supplies). Emphasis will be placed on development of products and services leading to self-support of the NODC.

**1.11 Provision of operational support for startup NOIC**

- Support can be provided for day-to-day operational expenses required to operate the NOIC (telecom, Internet access, office supplies). Emphasis will be placed on development of products and services leading to self-support of the NOIC.

**1.12 Provision of operational support for operational NODC**

- Some support may be provided for operational support of established and operating NODCs. This support should be justified by appropriate documentation. It is recommended that the cost be covered by the country.

**1.13 Provision of operational support for operational NOIC**

- Some support may be provided for operational support of established and operating NODCs. This support should be justified by appropriate documentation. It is recommended that the cost be covered by the country.

**1.14 Creation and operation of e-groups**

- When NODCs and NOICs will have been formally established in most countries participating in the project, then they will be networked through the ODINCINDIO project and the electronic mailing lists (forums) will be organized to encourage communication between the partner institutions. This service will be hosted by the IOGOOS Secretariat (INCOIS, India)

**2.1 Organization regional data management training course (BASIC LEVEL)3 courses**

- Three regional data management training courses will be organized covering the knowledge and skills in the following areas: Basic computer skills; the importance of marine data in general, and particularly within the participants' national and regional environments; how to set up an oceanographic data center within the IODE System; infrastructure requirements, including

hardware and software tools; how to manipulate and analyze the principal types and formats of marine data; and how to produce ocean data products and to disseminate the products, both over the Internet and by traditional methods, setting up and use of Internet clients for WWW browsing and email fundamentals of data analysis (document and spreadsheets formatting, creation of hydrographic datasets, gridding); development of metadata-base and data archives; use of Geographic Information Systems (creation of GIS files, image and data synthesis); preparation of project proposals. The venue will be decided based upon logistic requirements, to be provided by the IOC Secretariat. In addition there will be a capacity/knowledge assessment of the students prior to the course in order to adjust the programme to the needs of the students.

**2.2 Organization regional information management training course (BASIC LEVEL)3 courses**

- Three regional information management training courses will be organized covering basic skills in Marine Information Management, including introduction to information Technology and development of library catalogues, setting up user services, information seeking in an electronic environment, and exploitation of information resources in marine sciences. The venue will be decided based upon logistic requirements, to be provided by the IOC Secretariat. In addition there will be a capacity/knowledge assessment of the students prior to the course in order to adjust the programme to the needs of the students.
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**2.3 Organization regional data management training course (ADVANCED LEVEL)2 courses**

- Two regional training courses will be organized covering advanced oceanographic data management with special emphasis on new technologies and operational oceanography. The programme of these courses is under development as part of the ODIMeX (OceanTeacher) curriculum and will be available as from June 2005. The venue will be decided based upon logistic requirements, to be provided by the IOC Secretariat

**2.4 Organization regional information management training course (ADVANCED LEVEL): 2 courses**

- Two regional training courses will be organized covering advanced oceanographic information management with special emphasis on new technologies. The programme of these courses is under development as part of the ODIMeX (OceanTeacher) curriculum and will be available as from June 2005. The venue will be decided based upon logistic requirements, to be provided by the IOC Secretariat

**2.5 Remote sensing application training course (IOGOOS)**

- This course is part of the IOGOOS programme (responsible: Merv. Lynch). The venue will be decided based upon logistic requirements, to be provided by the IOC Secretariat.

**2.6 Numerical modeling training (IOGOOS), possibly through higher education institutions in the region**

- Part of IOGOOS programme.

**2.7 Helpdesk service data management training**

- A small team of experts will be contracted to provide internet-based (email) follow-up and support. They ensure that the trainees can make optimum use of the knowledge gained during the training course and it ensures full implementation of take home' tasks assigned during the course. The experts involved could be some of the trainers provided the training courses.

**2.8 Helpdesk service information management training**

- A small team of experts will be contracted to provide internet-based (email) follow-up and support. They ensure that the trainees can make optimum use of the knowledge gained during the training course and it ensures full implementation of take home' tasks assigned during the course. The experts involved could be some of the trainers provided the training courses.

**2.9 Short-term visits to other data/information centres (1 week); Internships of data or information managers in other institutions inside or outside the region (3 months); Visits of external experts to data/information centres in the region**

- In order for starting or established data/information managers to familiarize themselves with the work in well established data/information centres or to improve their knowledge, the project will fund travel/study grants.

**2.10 Support for ASFA subscriptions**

- IOC will investigate possibilities to obtain reduced pricing for ASFA subscriptions (probably the Internet version).

**2.11 Provide guidelines for data management (QC,…)**

- IOC will provide formal guidelines as relevant to oceanographic data management (as used by NODCs)

**2.12 Provide guidelines for information management (catalogues structure etc)**

- IOC will provide formal guidelines as relevant to oceanographic information management (as developed by GE-MIM)

**3.1 Support to enhance national awareness**

- To enhance awareness about the importance of oceanographic data management and information management, NODCs and NOICs will developed a number of awareness products such as brochures, posters, newsletters etc. The NODCs and NOICs may also organize national awareness workshops for data and information users.

**3.2 Development and maintenance of project web site**

- In order to assist with the coordination of project activities, as well as to create awareness for and to promote the project, an ODINCINDIO project website will be developed. It will be hosted and maintained by the Project Office.

**3.3 Development of electronic newsletter (for distribution in member countries)**

- In order to develop and maintain awareness amongst users within the countries for the achievement of the project an electronic newsletter will be prepared and issued at least twice a year. It will contain content highlights from the web site and will be aimed at the users of oceanographic data and information. This product will be produced by the Project Office.

**3.4 Development of regional awareness tools (posters, brochures,…)**

- In order to create awareness in the participating countries for the ODINCINDIO projects a number of awareness products will be developed and distributed. These

will include brochures and posters. They will be prepared by the Project Office and distributed to the participating NODCs and NOICs for national distribution.

**4.1 repatriation of data collected by other countries (GODAR activity)**

- A substantial number of research cruises and/or research activities have been carried out in the EEZs of participating countries by foreign research vessels and scientists. Often these data have not been provided to the countries where the data were collected. The project will organize the digitization (as necessary) and repatriation of such data to the region. This will be done through the GODAR project. This will be implemented jointly by the WDC Oceanography in Solver Spring (USA), the RNODC-INDO, the RNODC-Persian Gulf, and the Project Office.

**4.2 development of national metadatabases (NODC)**

- In order to ensure the best possible knowledge on data sets available within the region, cooperating institutions will be requested to develop national oceanographic metadata bases (where they currently don't exist). Where they exist cooperating countries will be requested to ensure that they comply with the agreed upon international standard for metadata bases (IOC will provide guidelines: MEDI project). It is recommended that the cost be covered by the country.

**4.3 updating of national metadatabases (NODC)**

- The national metadata bases will require continuous updating It is recommended that the cost be covered by the country.

**4.4 development of regional metadatabase (based upon national DBs)**

- In order to enable all participating countries to benefit from the data resources available within the region it is recommended to develop a regional metadata base. This will be developed based upon the developed/existing national oceanographic metadata bases and served through a central regional portal. Appropriate new technology for distributed databases and/or harvesting will be utilized to develop and provide this service. The service will be developed and hosted jointly by the Project Office and RNODCs in the region (to be decided). Cooperation will also be considred with the Global Change Master Directory (GCMD) project which collaborates with the IOC MEDI project.

**4.5 updating of regional metadatabase (based upon national DBs) (will be part of 4.3)**

- There will be no need for specific updating of records of the metadata base as it will contain the combined records of the national metadata bases of which the updating is covered under 4.3, but depending on the technology used regular harvesting of new records may be required. This activity will be implemented by the Project Office and RNODCs (to be decided)

**4.6 development of national library holding databases (NOIC)**

- Where not available it is recommended to develop a national library holding database, to ensure optimum resource sharing at the national level of available books, journals and other scientific publications. IOC will provide guidance on ILMS (integrated library management software) and related information management technology. It is recommended that the cost be covered by the country.

**4.7 updating of national library holding databases (NOIC)**

- The national library holding databases will require continuous updating. It is recommended that the cost be covered by the country.

**4.8 development of regional library holding database (based upon national DBs)**

- In order to ensure optimum resource sharing at the regional level, the national library holding databases will be merged (or harvested) and served through a central regional portal. This service will be developed and hosted by the Project Office.

**4.9 updating of regional library holding database (based upon national DBs) (note: will be part of 4.7)**

- There will be no need for specific updating of records of the regional library holding database as it will contain the combined records of the national databases of which the updating is covered under 4.7, but depending on the technology used regular harvesting of new records may be required. This activity will be implemented by the Project Office

**4.10 development of national experts directory (NOIC)**

- In order to ensure awareness at the national level of the expertise available at the national level it is recommended to develop national experts directories.This information will be valuable for all stakeholders to identify relevant experts to deal with specific issues and avoid continued reliance on external experts when local expertise is available. IOC will provide information on available standards for the database. It is recommended that the cost be covered by the country.

**4.11 updating of national experts directory (NOIC)**

- The national experts directory will require regular updating. It is recommended that the cost be covered by the country.

**4.12 development of regional experts directory**

- It will be appropriate to share the experts directory at the regional level in order to maximize the self-reliance on indigenous expertise available in the region. The national directories will be merged (or harvested) and served through a central regional portal. This service will be developed and hosted by the Project Office.

**4.13 updating of regional experts database (note: will be part of 4.11)**

- There will be no need for specific updating of records of the regional expert database as it will contain the combined records of the national databases of which the updating is covered under 4.11 but depending on the technology used regular harvesting of new records may be required. This activity will be implemented by the Project Office

**4.14 develop national e-repository of publications produced by national experts (full-text electronic) (NOIC)**

- In order to promote the scientific achievements of researchers in participating countries it is recommended to develop national e-repositories of publications produced by national experts. This system will enable searching the bibliographic fields (title, author, journal, abstract) and will enable the downloading of the full-text publication. The e-repository may include both published papers (published in national or international journals) as well as grey literature (unpublished reports, notes on progress, institutional annual reports, etc). The system will use an international standard for e-repositories and software as recommended by the GE-MIM. Software will be provided by IOC. It is recommended that the cost be covered by the country.

**4.15 updating national e-repository of publications produce by national experts (full-text electronic) (NOIC)**

- The national e-repository will require regular updating. It is recommended that the cost be covered by the country.

**4.16 develop regional e-repository of publications produce by regional experts (full-text electronic)**

- In order to share the national e-repositories at the regional (and international) level a regional repositrory portal will be developed. This will be a merged or centrally harvested system. It will be developed and hosted by the Project Office.

**4.17 maintain regional e-repository of publications produced by regional experts (full-text electronic) (will be part of 4.15)**

- There will be no need for specific updating of records of the regional e-repository as it will contain the combined records of the national databases of which the updating is covered under 4.15 but depending on the technology used regular harvesting of new records may be required. This activity will be implemented by the Project Office

**5.1 support for organization of national workshops on data/information services/products for the sustainable management of coastal resources**

- To enhance awareness about the importance of oceanographic research for sustainable management of coastal resources, cooperating countries will organize national awareness workshops. This is related to activity 3.1 but in this case the scope is wider and the NODCs and NOICs will be seen as core elements in a "research and management chain". It is recommended that the cost be covered by the country.

**5.2 support for development of data and information products**

- The most important activity of NODCs and NOICs is the development of user products and services: data and information centres cannot be isolated data or information archives but must operate in a continnum that responds to issues and to short-term or long-term environmental/climate problems. As such research needs to respond to issues defined by decision makers and other stakeholders. The research implemented will generate data and information that will be managed by the NODCs and NOICs. They, in close cooperation with the research community, will develop products and services that can be provided to the decision makers and stakeholders to respond to the original issue/problem. It is recommended that the cost be covered by the country.

OBJECTIVE 6

**6.1 Travel support for project coordinator to attend relevant meetings and project events**

- In order to promote the project and to ensure that the project serves the needs of national, regional and international organizations, programmes and projects, it is recommended that the Project Coordinator participates in relevant meetings.

OBJECTIVE 7

**7.1 Annual meeting of the Project Steering Committee**

- The project will be directed, monitored and supervised by a Project Steering Committee. It is recommended that this will meet once a year.

## 4. ACTIVITIES WORK PLAN AND BUDGET

| Objective | Activity | Expected Output/DelIverable | Timing | Cost | Comments |
|---|---|---|---|---|---|
| **1 NODC/NOIC establishment and support** | 1.1 Establishment of national oceanographic committees (including all ocean and coastal area stakeholders) | Short report on membership | Early 2005 | No cost | Include meteo service |
| | 1.2 Organization of advisory mission of IODE expert to member state to advise on establishment of national oceanographic data centre (NODC) and national oceanographic information centre (NOIC) – based upon relevant IOC Manuals and Guides | Report of expert to member state and to IOC | 2005 | US$ 3000 per mission per country | Recommended to be covered by country |
| | 1.3 Meeting of national oceanographic committee to identify suitable host institutions for national oceanographic data centre (NODC) and national oceanographic information centre (NOIC) and identify their respective national coordinators; decide on distributed or centralized structure | Letter to IOC announcing selected host institutions and national coordinators (based upon relevant IOC Manuals and Guides) as well as structure (centralized/distributed) | 2005 | US$ 2000 per country | Recommended to be covered by country |
| | 1.4: following response by IOC to letter prepared under 1.3: Formal establishment of NODC | (i) Posting of information on IODE web site<br>(ii) Circular Letter to members of National Oceanographic Committee | 2005 | No cost | |
| | 1.4a: following response by IOC to letter prepared under 1.3: Formal establishment of NOIC | (i) Posting of information on IODE web site<br>(ii) Circular Letter to members of National Oceanographic Committee | 2005 | No cost | Subject to adoption of NOIC structural element by IODE-XVIII |
| | 1.5 organize regular meetings of national oceanographic committee (eg annual) | Report | 2005<br>2006<br>2007 | To be determined | Recommended to be covered by country |
| | | | | | |

| Objective | Activity | Expected Output/Deliverable | Timing | Cost | Comments |
|---|---|---|---|---|---|
| | 1.6 Procurement of startup hardware/software NODC | Equipment installed | 2005 | US$10,000/ country | Config. Descr. to be provided by IODE Sec |
| | 1.7 Procurement of additional hardware/software NODC | Equipment installed | 2005 | US$ 5,000/ country | |
| | 1.8 Procurement of startup hardware/software NOIC | Equipment installed | 2005 | US$ 10,000/ country | |
| | 1.9 Procurement of additional hardware/software NOIC | Equipment installed | 2005 | US$ 5,000/ country | |
| | 1.10 Provision of operational support for startup NODC | Regular report on progress | 2005<br>2006<br>2007 | US$5,000/ country/ year | |
| | 1.11 Provision of operational support for startup NOIC | Regular report on progress | 2005<br>2006<br>2007 | US$5,000/ country/ year | |
| | 1.12 Provision of operational support for operational NODC | Regular report on progress | 2005<br>2006<br>2007 | tbd | Recommended to be covered by country |
| | 1.13 Provision of operational support for operational NOIC | Regular report on progress | 2005<br>2006<br>2007 | tbd | Recommended to be covered by country |
| | 1.14 Creation and operation of e-groups | Report on creation | End 2004 | None | To be hosted by IOGOOS Secretariat |
| **2 Capacity Building** | 2.1 Organization regional data management training course (BASIC LEVEL)<br>3 courses | (i) Report on course<br>(ii) Certificate of completion for each participant | 2005 (2nd half)<br>2006<br>(2007)<br>possibly 2 courses in 2006 | US$ 3500/pp/course (based on 10 participants incl. cost of 3 resource persons) | Venue to be identified based upon logistic requirements<br>Requires capacity survey of students |
| | 2.2 Organization regional information management training course (BASIC LEVEL)<br>3 courses | (i) Report on course<br>(ii) Certificate of completion for each participant | 2005 (2nd half)<br>2006<br>(2007)<br>possibly 2 courses in 2006 | US$ 3500/pp/course (based on 10 participants including cost of 3 resource persons) | Venue to be identified based upon logistic requirements<br>Requires capacity survey of students |
| | | | | | |
| | | | | | |

| Objective | Activity | Expected Output/Deliverable | Timing | Cost | Comments |
|---|---|---|---|---|---|
| | 2.3 Organization regional data management training course (ADVANCED LEVEL)<br>2 courses | (i) Report on course<br>(ii) Certificate of completion for each participant | 2005 (2nd half)<br>2006 | US$ 3500/pp/course (based on 10 participants including cost of 3 resource persons) | Venue to be identified based upon logistic requirements |
| | 2.4 Organization regional information management training course (ADVANCED LEVEL)<br>2 courses | (i) Report on course<br>(ii) Certificate of completion for each participant | 2005 (2nd half)<br>2006 | US$ 3500/pp/course (based on 10 participants including cost of 3 resource persons) | Venue to be identified based upon logistic requirements |
| | 2.5 Remote sensing application training course (IOGOOS) | (i) Report on course<br>(ii) Certification of completion for each participant | 2005 or 2006 | US$ 3500/pp (based on 10 participants including cost of 3 resource persons) | Venue to be identified based upon logistic requirements<br>Need to verify with Merv Lynch (IOGOOS) |
| | 2.6 Numerical modeling training (IOGOOS), possibly through higher education institutions in the region | | 2006-… | To be identified | IOC action IOGOOS workplan |
| | 2.7 Helpdesk service data management training | Annual report by helpdesk provider and by users | 2005<br>2006<br>2007 | US$ 5000/year | |
| | 2.8 Helpdesk service information management training | Annual report by helpdesk provider and by users | 2005<br>2006<br>2007 | US$ 5000/year | |
| | 2.9 Short-term visits to other data/information centres (1 week); Internships of data or information managers in other institutions inside or outside the region (up to 3 months); Short-term Visits of external experts to data/information centres in the region | Reports | 2005<br>2006<br>2007 | Up to US$ 5000/ pp/year | |

| Objective | Activity | Expected Output/Deliverable | Timing | Cost | Comments |
|---|---|---|---|---|---|
| | 2.10 Support for ASFA subscriptions | Subscriptions | 2005<br>2006<br>2007 | US$ 3000/ country/ year | Cost to be clarified by IOC |
| | 2.11 Provide guidelines for data management (QC,…) | Documentation distributed to countries | 2005 | None | To be done by IOC |
| | 2.12 Provide guidelines for information management (catalogues structure etc) | Documentation distributed to countries | 2005 | None | To be done by IOC |
| **3 awareness** | 3.1 Support to enhance national awareness | Materials produced | 2005<br>2006<br>2007 | US$ 4000/ country/ year | Recommended to be covered by country |
| | 3.2 Development and maintenance of project web site | Website online | 2005<br>2006<br>2007 | US$1000/year | To be done by project office |
| | 3.3 Development of electronic newsletter (for distribution in member countries) | Newsletter issued twice a year | 2005<br>2006<br>2007 | No cost | To be done by project office |
| | 3.4 Development of regional awareness tools (posters, brochures,…) | Materials produced | 2005<br>2006<br>2007 | US$2000/year | To be done by project office |
| **4 product dev** | 4.1 repatriation of data collected by other countries (GODAR activity) | Data CD or DVD | 2005 | US$ 10,000 | Implemented by WDC Oceanography USA, RNODC-INDO and RNODC-PG and project office |
| | 4.2 development of national metadatabases (NODC) | Database developed and available online | 2005<br>2006 | US$ 2000/ country/ year | Recommended to be covered by country |
| | 4.3 updating of national metadatabases (NODC) | Annual progress report | 2007 | US$1000/country/ year | Recommended to be covered by country |
| | 4.4 development of regional metadatabase (based upon national DBs) | Database developed and available online | 2006<br>2007 | No cost | By Project Office + RNODCs |
| | 4.5 updating of regional metadatabase (based upon national DBs) (will be part of 4.3) | Annual progress report | 2006<br>2007 | No cost | By Project Office + RNODCs |

| | | | | | |
|---|---|---|---|---|---|
| **Objective** | **Activity** | **Expected Output/ Deliverable** | **Timing** | **Cost** | **Comments** |
| | 4.6 development of national library holding databases (NOIC) | Database developed and available online | 2005<br>2006 | US$ 2000/country/ year | Recommended to be covered by country |
| | 4.7 updating of national library holding databases (NOIC) | Annual progress report | 2007 | US$1000/country/ year | Recommended to be covered by country |
| | 4.8 development of regional library holding database (based upon national DBs) | Database developed and available online | 2006<br>2007 | No cost | By Project Office |
| | 4.9 updating of regional library holding database (based upon national DBs) (note: will be part of 4.7) | Annual progress report | 2007 | No cost | By Project Office |
| | 4.10 development of national experts directory (NOIC) | Database developed and available online | 2005 | US$1000/country/ year | Recommended to be covered by country |
| | 4.11 updating of national experts directory (NOIC) | Annual progress report | 2006<br>2007 | US$1000/country/ year | Recommended to be covered by country |
| | 4.12 development of regional experts directory | Database developed and available online | 2006<br>2007 | No cost | By Project Office |
| | 4.13 updating of regional experts database (note: will be part of 4.11) | Annual progress report | 2006<br>2007 | No cost | By Project Office |
| | 4.14 develop national e-repository of publications produce by national experts (full-text electronic) (NOIC) | E-repository available online | 2005 | US$ 2000/country/ year | Recommended to be covered by country |
| | 4.15 updating national e-repository of publications produce by national experts (full-text electronic) (NOIC) | Annual reports | 2006<br>2007 | US$1000/country/ year | Recommended to be covered by country |
| | 4.16 develop regional e-repository of publications produce by regional experts (full-text electronic) | E-repository available online | 2005<br>2006 | No cost | By Project Office |
| | 4.17 updating regional e-repository of publications produce by regional experts (full-text electronic) (will be part of 2.15) | Annual reports | 2006<br>2007 | No cost | By Project Office |
| **5 dissemination** | 5.1 support for organization of national workshops on data/information services/products for the sustainable management of coastal resources | Report | 2006<br>2007 | US$ 6,000/country/ year | Recommended to be covered by country |
| | 5.2 support for development of data and | Products and services | 2006 | US$ 10,000/ | Recommended to be |

| | | | | | |
|---|---|---|---|---|---|
| | information products | | 2007 | country/ year | covered by country |
| **Objective** | **Activity** | **Expected Output/ Deliverable** | **Timing** | **Cost** | **Comments** |
| **6. cooperation** | Travel support for project coordinator to attend relevant meetings and project events | Reports | 2005<br>2006<br>2007 | US$ 15,000/year | Focus also on major scientific events in the region |
| **7 project coordination** | Annual meeting of Steering Committee | Reports | 2005<br>2006<br>2007 | US$40,000/year | |
| | Project Office operational expenses | Report (including financial) | 2005<br>2006<br>2007 | US$ 2,000/year | Recommended to be covered by host country/institution of Project Office |

## 5. PROJECT MANAGEMENT

The main objective is to ensure that the work programme is fully implemented as planned, both at the national and regional level, and that deliverables are produced in a timely fashion within the agreed timeframe.

The below terms of reference are provisional and can be revised by the Project Steering Committee in order to ensure the best possible implementation of the Project.

**Project Management structure**

- The project will be steered by a Project Steering Committee;
- The project will be coordinated on a day-to-day basis by a Project Coordinator;
- The Project Coordinator will execute his/her work from the Project Office;

**Project Steering Committee composition**

- IODE National Coordinators for oceanographic data management
- IODE National Coordinators for oceanographic information management
- Project Coordinator
- IODE Regional Coordinator (IOCINDIO)
- Head RNODC-INDO
- Head RNODC-Persian Gulf Region [1]
- ROPME Chair
- IOCINDIO Chair
- IOGOOS Chair
- IOC secretariat representative(s)
- Donor(s) representatives

Note: others can be invited as required

**Project Steering Committee Terms of Reference**

The PSC will direct, monitor and supervise the overall implementation of the project. It will meet once every year. During its annual meetings it will:

1. Receive, comment on, and endorse national reports (including financial reports) submitted by the IODE national coordinators for oceanographic data management and IODE national coordinators for oceanographic information management on activities carried out, and deliverables produced during, the past year within the framework of the project work plan;
2. Receive, comment on, and approve national work plans and budgets submitted by the NODC and NOIC (if applicable) for the next year within the framework of the project work plan, including possible recommendations for amendments;
3. Receive, comment on, and approve reports by the Project Coordinator on progress of regional products and services (including financial report);
4. Receive, comment on, and approve work plans and budgets for regional products and services for the next year;

[1] terms of reference of the RNODC-PG are available on the IODE web site on http://www.iode.org/iode/contents.php?id=18

5. Receive, comment on, and approve the report (including financial report as applicable) by the Project Coordinator on the activities and expenditure of the Project Office;
6. Based upon the report mentioned under 5 above, define and approve the work plan and budget of the Project Office for the next year;
7. Formulate relevant recommendations or requests for submission to IOC Subsidiary Bodies and programmes, as well as other organizations and programmes with the purpose of obtaining funding for the implementation of project activities in the next year(s);
8. Receive, comment on, and decide on offers to host training courses;
9. Receive, comment on, and decide on requests for short term visits, internships and visiting experts, within the available budget (or recommend fund seeking actions);
10. Identify and review collaboration between ODINCINDIO and other organizations, programmes and projects (specifically IOGOOS and ROPME);
11. Review and decide upon applications of IOCINDIO member states to participate in the ODINCINDIO project;
12. The Project Coordinator and Project Office shall be identified by the Project Steering Committee upon approval of written applications by candidates for the position of Project Coordinator

**Project Office**

The Project Office shall be hosted by the institution that employs the Project Coordinator. The Project Office shall host the Project Coordinator and, in addition, host the regional products and services as identified in the Work plan;

**Project Coordinator**

The Project will be managed on a day-to-day basis by the Project Coordinator. The Project Coordinator will have the following job description:

1. Maintain close contacts with all NODCs and NOICs (as applicable) and their coordinators in the region;
2. Make the necessary arrangements for meetings of the Project Steering Committee;
3. Prepare detailed work plan and timetable for current year, for submission to the Project Steering Committee for approval;
4. Make necessary logistic preparations for training courses, in close collaboration with the host institution;
5. Prepare draft contracts or other relevant formal document for implementation of activities as included in the approved work plan for submission to the relevant funding agency;
6. Host and maintain regional products and services as detailed in the work plan;
7. Establish and maintain close contacts with relevant organizations, programmes and projects;
8. Submit regular (quarterly) project progress reports to all cooperating institutions and collaborating organizations, programmes and projects.

The Project Coordinator and Project Office will be selected based upon the following requirements:

**Selection of the Project coordinator**:
The Project Coordinator shall be selected based upon the following requirements:

1. The Project Coordinator should work in an operational NODC or NOIC (as applicable) in the region and have the relevant technical qualifications and experience, expertise and experience;
2. The Project Coordinator should have demonstrable project management experience.

**Selection of the Host Institution:**
The Host Institution of the Project Office should be selected based upon the following requirements:

1. The Host Institution of the Project Office should provide the office space for the Project Office (including utilities);
2. The Host Institution of the Project Office should provide a permanent internet connection for the provision of the project's internet-based regional services and products, as well as for the communication requirements of the Project Coordinator;
3. The Host Institution of the Project Office should have sufficient staff so as to enable the continued functioning of the NODC and NOIC (as applicable);
4. The Host Institution of the Project Office should enable the Project Coordinator to utilize the necessary time for his/her project coordination responsibilities including related project travel.

When speaking or acting on behalf of the Project, the Project Coordinator shall act as representative of the Project and its participating member institutions, and not as a representative of his/her own institution/government.

The Project Coordinator and Project Office shall be identified by the Project Steering Committee upon approval of written applications by candidates for the position of Project Coordinator. The application should include a letter of approval by the Head of the host institution in which the host institution agrees to (i) host the Project Office for a duration of TWO years; and (ii) "second" the applicant to enable him/her to execute the job of Project Coordinator of the ODINCINDIO project for a duration of TWO years.

# Annex V

## List of Participants

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**Annex VI**

**Welcome Speeches**

**Welcome speech of Dr. Nasser Hadjizadeh Zaker**

In the Name of God

Dr. Abdin Saleh , Director of UNESCO Office, Tehran
Dr Pissierssens, Head of Ocean Services, IOC/UNESCO
Dr. Hassan Mohammadi, Acting Coordinator of ROPME

Distinguished Guests
Dear Colleagues

It is my pleasure to welcome you, on behalf of the Iranian National Center for Oceanography to this 4-day regional planning meeting on Ocean Data and Information Networking for the Central Indian Ocean, ODINCINDIO. We are very much honored to host this meeting and I would like to thank IOC, IOCINDIO, IODE, IOGOOS and ROPME for their support and having chosen INCO as the venue for this Important meeting.

Ladies and Gentlemen

As we are all aware, the oceans and their seas play a crucial role in the process of life on the planet. The air we breathe, the water we drink, the food we eat, and the climate in which we live, all depend on the oceans. The use of the oceans and seas, as regard transportation, trade, living and non-living resources, occupies an increasingly significant position in today's world.

The importance of oceans for the human life and the development of countries became a momentum for their better understanding and the utilization of this knowledge to improve management, sustainable development and protection of ocean environments. In this regard the effective management of data and information resulting from various research projects, and oceanographic monitoring, as well as provision of easy access to such data plays an important role. In addition, the ubiquitous nature of seas and oceans requires the collaboration and coordination among various countries with regard to oceanographic research, capacity building and exchange of data and information.

The Indian Ocean is one of the three most important oceans on the Earth. Its coasts extend along three continents and the lives of at least 1.5 Billion people are profoundly influenced by the Indian Ocean and many countries around this ocean depend to a large extent on marine and coastal resources. Therefore, the ability to acquire, manage, archive and disseminate data, as well as the capacity to generate information in support of decision making and management of the oceans and coastal zones is of vital importance.

The Ocean Data and Information Network for the Central Indian Ocean Region (ODINCINDIO) Project responds to these needs. It focuses on building capacity, establishing national oceanographic data centers, regional networking and the development of products and services at the national and regional scale. ODINCINDIO will benefit from the experience achieved from other ODIN projects, in particular, ODINAFRICA and ODINCARSA (Caribbean and South American region)

The ODINCINDIO proposal was first submitted to IODE committee which was welcomed. It was discussed in detail during the IOGOOS Workshop "Capacity Building and

Strategy for Ocean Data and Information Management", held in Hyderabad, India, 8-10 December 2003. The meeting stated that ODINCINDIO should be the capacity building instrument for IOGOOS and therefore recommended its development. The project also has been strongly supported by ROPME.

Today the distinguished delegates from the Indian Ocean Rim and respectful representatives from IOC, IOGOOS and ROPME are gathered here to discuss on and finalize ODINCINDIO proposal and its work plan. I thank all of them and wish very successful results for this meeting and also a very happy and enjoyable stay in Iran for our respectful guests who are coming from other countries.

Thank you for your attention.

**Opening Address to the**
**"First Planning Meeting for the Ocean Data & Information Network for the"**
**"Central Indian Ocean Region"**
**2~5 October 2004, Tehran, I.R. Iran**

**By**
**Dr. Abdin Salih**
**Representative and Director, UNESCO Tehran Office**

**Excellencies,**

**Ladies and Gentlemen, Good morning;**

I am indeed honored this morning to address you on behalf of the Director General of UNESCO, Mr. Kochiro Matsuura, and myself as the representative of UNESCO in I. R. of Iran and on behalf of my colleagues in IOC and the Science Sector of UNESCO on the occasion of the *"First Planning Meeting for the Ocean Data & Information Network for the Central Indian Ocean Region"*

Allow me first to thank the Government of I.R. of Iran, particularly the Ministry of Science, Research and Technology for their excellent cooperation with UNESCO in all areas of its programmes and the continued support given to our cluster office in Tehran. I would also welcome with appreciation ROMPE's partnership with UNESCO in various projects related to its mandate and UNESCO's objectives.

To all of you, I am honored to convey UNESCO's best wishes for a successful workshop and its commitments to work closely with you in the implementation of relevant recommendations of your meeting.

The theme of this workshop on "the Ocean Data & Information Network for the Central Indian Ocean Region" and its topics on:

i. Providing assistance in the development and operation of National Oceanographic Data (and information ) Centers establishing networking in the Central Ocean Region;
ii. Providing training opportunities in marine data and information management applying standard formats and methodologies as defined by IODE;
iii. Assisting in the development and maintenance of national, regional and Indian Ocean marine metadata, information and data holding databases;

iv. Assisting in the development and dissemination of marine and coastal data and information products responding to the needs of a wide variety of user groups using national and regional networks;

represent a very important contribution to capacity building and sustainable development with regard to oceanographic issues. They certainly receive great support from UNESCO.

**Ladies and gentlemen,**

Judging from the well-prepared background material, the diversity and high quality of participating colleagues, and the rich agenda of this workshop, an optimum recipe has certainly been provided for a successful meeting. The selection of the venue, Tehran, with its beauty and the great heritage of this country will certainly add to the creation of an enabling environment for its success.

For all these reasons, UNESCO hopes and intends to play an active part in the implementation of relevant recommendations resulting from your deliberations. The role of the Iranian Center for Oceanography in promoting this partnership at the national, regional and international levels is greatly valued by UNESCO.

Before I end my address, I must thank, on behalf of UNESCO, the Iranian Government, particularly Dr Nasser Hajizadeh Zaker, Director of Iranian National Center for Oceanography of the Ministry of Culture and Higher Education and his wonderful team in the center. Last, but not least, my appreciation and thanks extend to you all, the participants and the guests, from Iran and abroad, and I wish you a successful and beneficial workshop.

Thank you.

## Annex VII

## List of Acronyms

| | |
|---|---|
| ASFA | Aquatic Sciences & Fisheries Abstracts |
| CB | Capacity Building |
| CL | Circular Letter |
| CLIVAR | Climate variability & Predictability (WCRP component) |
| COOP | Coastal Ocean Observations Panel |
| DBMS | DataBase Management System |
| DNA | Designated National Agency |
| DODS | Distributed Oceanographic Data System |
| E2EDM | End-to-End Data Management |
| ET | Expert Team |
| ETDMP | Expert Team on Data Management Practises (JCOMM) |
| EU | European Union |
| EURASLIC | European Association of Aquatic Sciences Libraries and Information Centres |
| FAO | Food and Agriculture Organization of the United Nations |
| GCMD | Global Change Master Directory (NASA) |
| GE-BICH | IODE Group of Experts on Biological & Chemical Data Management & Exchange Practices (former GE-BCDMEP) |
| GEMIM | IODE Group of Experts on Marine Information Management |
| GEO | Group on Earth Observations |
| GIS | Geographic Information System |
| GLODIR | Global Directory of Marine and Freshwater Professionals (OceanExpert) |
| GLOSS | Global Sea Level Observing System |
| GODAE | Global Ocean Data Assimilation Experiment |
| GODAR | Global Oceanographic Data Archaeology & Rescue Project |
| GOOS | Global Ocean Observing System |
| GOSUD | Global Ocean Surface Underway Data (IODE pilot project) |
| GPO | GOOS Project Office |
| GRAs | GOOS Regional Alliances |
| GSC | GOOS Steering Committee |
| GTS | Global Telecommunication System (WMO) |
| GTSPP | Global Temperature-Salinity Profile Project |
| IAMSLIC | International Association of Aquatic and Marine Science Libraries and Information Centers |
| ICAM | Integrated Coastal Area Management |
| ICES | International Council for the Exploration of the Sea |
| ICSU | International Council of Scientific Unions |
| IFREMER | Institut Français de Recherche pour l'Exploitation de la Mer (France) |
| IGBP | International Geosphere-Biosphere Programme - A Study of Global Change |
| INCOIS | Indian National Centre for Ocean Information Services (Indian) |
| IOC | Intergovernmental Oceanographic Commission |
| IOCARIBE | IOC Sub-Commission for the Caribbean & Adjacent Regions |
| IOCEA | IOC Regional Committee for the Central Eastern Atlantic |
| IOCINCWIO | IOC Regional Committee for the Co-operative Investigation in the North & Central Western Indian Ocean |
| IOCINDIO | IOC Regional Committee for the Central Indian Ocean |
| IODE | International Oceanographic Data & Information Exchange |
| IOGOOS | Indian Ocean Global Ocean Observing System |
| JCOMM | Joint WMO-IOC Technical Commission for Oceanography & Marine Meteorology |

| | |
|---|---|
| JCOMMOPS | JCOMM in-situ Observing Platform Support Centre |
| JGOFS | Joint Global Ocean Flux Study |
| MEDI | Marine Environmental Data Inventory (IOC) |
| MEDS | Marine Information Data Service (Canada) |
| NASA | National Aeronautics and Space Administration (USA) |
| NODC | National Oceanographic Data Centre |
| NOP | National Oceanographic Programme |
| OBIS | Ocean Biogeographic Information System (Cenus of Marine Life) |
| ODIN | Ocean Data and Information Network |
| ODINAFRICA | Ocean Data & Information Network for Africa |
| ODINCARSA | Ocean Data & Information Network for Central & South America |
| ODINCINDIO | Ocean Data & Information Network for the Indian Ocean |
| ODINEA | Ocean Data & Information Network for Eastern Africa |
| ODINLAC | Ocean Data & Information Network for Latin American Countries |
| OIT | Ocean Information Technology |
| OOPC | Ocean Observation Panel for Climate (GCOS) |
| POGO | Partnership for the Observation of Global Oceans |
| QC | Quality control |
| RNODC | Responsible National Oceanographic Data Centres |
| RNODC-INDO | Responsible National Oceanographic Data Centre for the Indian Ocean |
| ROPME | Regional Organization for the Protection of the Marine Environment |
| SCOR | Scientific Committee for Oceanic Research |
| SOOP | Ship-of-Opportunity Programme |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific & Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| URL | Uniform Resource Locator |
| VOS | Voluntary Observing Ship (Vessel of Opportunity; Ship-of-Opportunity) |
| WDC | World Data Centre |
| WMO | World Meteorological Organization |
| WOD | World Ocean Database |
| WOCE | World Ocean Circulation Experiment |

[END]