



Intergovernmental Oceanographic Commission (IOC)

**Contribution by UNESCO/IOC to the Report of the Secretary General to the 58th Session of the
General Assembly on Oceans and the Law of the Sea**

January 2003

**CONTRIBUTION BY UNESCO/IOC TO THE REPORT OF THE UN SECRETARY GENERAL TO
THE 58TH SESSION OF THE GENERAL ASSEMBLY ON "OCEANS AND THE LAW OF THE SEA"
(INTENDED FOR THE MAIN BODY OF THE REPORT)**

MANDATE:

The 31st General Conference of UNESCO authorized the Director-General (a) to implement the corresponding plan of action in order to: (i) improve scientific knowledge and understanding of oceanic and coastal processes with a view to assisting UNESCO Member States in the design and implementation of sustainable policies for the ocean and coastal zones, through the organization and coordination of major scientific programmes, responding to the mandate of UNCLOS, UNCED/Agenda 21 and the Global Conventions of Climate Change and Biodiversity and regional conventions, and by reinforcing the capacity of developing countries particularly by targeting sub-Saharan Africa in the framework of the African Process and Programmes in the development of scientific mechanisms for an ecosystem approach; (ii) organize the collection of ocean and coastal observations, the modelling and the production of forecasts needed for the management and sustainable development of the open and coastal ocean, particularly by implementing the Global Ocean Observing System and its related pilot projects and regional components, and by increasing the capacities and participation and full involvement of developing countries; (iii) further developing the International Oceanographic Data and Information Exchange (IODE) system through the establishment of new national oceanographic data and information exchange facilities, the creation of needed capacities, particularly in developing countries, and the provision of access by a wide community of users to current ocean data and information in accordance with the existing United Nations Conventions and UNESCO's approach on data and information; (iv) to intensify the follow-up to the Pan African Conference on Sustainable Integrated Coastal Management (PACSIKOM);

GLOBAL RESULT 1 **International cooperation and coordination of programmes is promoted in research, services and capacity-building, in order to learn more about the nature and resources of the ocean and coastal areas**

Achievements in 2002 Two big results marked 2002 for IOC. The first one was the achievement of a long-standing work in Africa in relationship with coastal and environmental issues. The follow-up, from 1998, to the Pan-African Conference on Sustainable Integrated Coastal Management (PACSIKOM) resulted in a series of regional coastal management projects, which will contribute to the operational phase of the African Process, in the framework of the Environment Component of NEPAD. The next biennium (2004-2005) will see the consolidation phase of this work. The second main result was the highly relevant place of ocean issues in the outcomes of WSSD. In fact, the Summit of Johannesburg called UNESCO/ IOC, through the Plan of Action of WSSD, to support the development of permanent capacities in ocean sciences, services and observations, particularly through WSSD Type II Partnerships on Oceans where IOC is identified as a partner. Direct contribution to these two big results are the sustained work of the IOC network of national institutions and scientific working groups that are coordinated by the Operational Observing System and the Ocean Services Sections.

GLOBAL RESULT 2 **New knowledge is applied for the improvement of management, sustainable development, the protection of the marine environment, and the decision-making processes of Member States of IOC**

Achievements in 2002 2002 was a very active year of IOC in the coordination of oceans agencies through the UN system, particularly in relation with the UNEP Governing Council Decision 21/13. IOC play an important role at the Bremen technical meeting and through its collaboration with UNEP/GMRC. A proposal to structure the Global Marine Assessment was delivered by IOC at the Bremen meeting and the process itself was highly placed by the 57th UN General Assembly, which requested a report on this issue at its 58th session, including on an eventual proposal to held an intergovernmental meeting during 2004. In this regard, the progress made during 2001 and 2002 by the IOC Ocean Science section coordinating working groups on the relation between climate and pelagic fisheries abundance and on ecosystem indicators for management of fisheries will produce useful and timely products for the GMA process during 2003 and 2004.

Policy activities

DESCRIPTION: This Action supported during 2002: 1) functioning of IOC governing bodies and the direct follow-up of their decisions and Resolutions; 2) coordination on Ocean Sciences, Observations and Services within the UN System; 3) improvements on the decision-making process of the Commission by its Assembly and Executive Council; 4) follow-up of major international environmental conventions, and 5) public awareness and publications, including the preparatory process towards the World Summit on Sustainable Development (Johannesburg, South Africa, September 2002)

STRATEGY : The strategy is based on increasing the effectiveness of the Governing bodies of the Commission, promote the use of e-publishing and e-communication, the creation and support of Partnerships with UN and non-UN organizations to implement different aspects of the IOC Programme, and the development of public awareness and dissemination tools based on traditional media and the new ICT's, such as specialized portals and websites.

RESULT: **Technical assistance provided to the International Seabed Authority (ISA), the Commission on the Limits of the Continental Shelf (CLCS) and the International Tribunal for the Law of the Sea (ITLOS)**

As formally requested by the Secretary General of the UN, IOC co-operates with two institutions established by UNCLOS namely the International Tribunal for the Law of the Sea (ITLOS) and the International Seabed Authority (ISA). A Memorandum of Understanding was signed with ISA on 7 July 2000.

Achievements in 2002 IOC participated at the Workshop on Prospects for International Collaboration in Marine Environmental Research to Enhance the Understanding of the Deep-Sea Environment in Kingston, Jamaica from 29 July to 2 August. Cooperation activities were analysed with ISA officers.

RESULT: **Organization of the Meetings of the Advisory Body of Experts on the Law of the Sea (ABE-LOS)**

Through the results of their meetings, ABE-LOS provides important advice to the Governing Bodies of IOC, and contributes to the implementation of UNCLOS in the area of Marine Scientific Research and the Transfer of Marine Technology and capacity building.

Achievements in 2002 ABE-LOS II was convened in accordance with Resolution XXI-2 adopted by the 21st Session of the IOC Assembly (Paris, 3-13 July 2001). It was held, on the invitation of the Kingdom of Morocco, at El Jadida, Morocco from 6 to 9 May 2002. The Third Meeting of ABE-LOS (ABE-LOS III) will take place in Lisbon, Portugal in May 2003.

RESULT: **The outcomes of the World Summit on Sustainable Development includes oceans as a high priority for sustainable development**

The WSSD outcomes will influence the work of IOC in the future, as much as the oceans issues will be highly placed on the results of the Governments agreements at WSSD. The XXI Assembly of IOC recognized the need to provide a global forum on oceans and coasts to a wide range of organizations, in order to deliver a stronger and more co-ordinated message at the World Summit on Sustainable Development in September 2002. This lead to the co-organization of the Global Conference on Oceans and Coasts, held in Paris at the end of 2001. The Assembly also recommended that additional pathways be explored for delivering a message from IOC to the WSSD, possibly through the IOC regional constituencies, or through UNESCO's participation as member of the Preparatory Committee of the World Summit on Sustainable Development.

Achievements in 2002: The role of IOC and its activities in the sustainable management of Oceans and Coasts was recognized at the World Summit on Sustainable Development (WSSD), especially through the Plan of Implementation, which is one of the two main political documents adopted by the Summit (the other one being the Political Declaration). Paragraph 34.d of the Implementation Plan states: " Strengthen the ability of the Intergovernmental Oceanographic Commission of the UNESCO(...) to build national and local capacity in marine science and the sustainable management of oceans and

their resources". Even if Oceans are not mentioned in the Political Declaration, many statements call for the reinforcement of the current policies.

RESULT: Adoption of relevant decisions and Resolutions on strategic or policy issues

Achievements in 2002 The 35th Executive Council held in HQs, 4-14 June, approved 8 resolutions on Programme and Policy matters. The Report of this meeting was edited, printed and distributed electronically to Member States during September 2002. The XXII Assembly of IOC is scheduled for 24 June-4 July 2003.

RESULT: Increased coordination and cooperation with UN agencies addressing ocean issues

In the framework of the initiative for the Ocean Assessment (UNEP) and through the statutory meetings of IOC's Governing Bodies, the coordination and cooperation with UN agencies addressing ocean issues is enhanced.

Achievements in 2002 IOC representatives attended the Technical Workshop for Establishing a Regular Process for the Global Assessment of the Marine Environment, Bremen, 18-20 March 2002. Furthermore, IOC has actively cooperated with the UNEP World Conservation Monitoring Centre (WCMC) in conducting a review of the scope, status and timing of existing and forthcoming assessment and assessment-related activities carried out under relevant national, regional and global organizations. Action has been undertaken to identify gaps in their coverage and ways in which they could be integrated into the GMA process. The results of this work will be presented to the next UNEP Governing Council (February 2003)

RESULT: Increased collaboration with IOC's partners outside the UN, including IOC Advisory Bodies

To participate in technical meetings addressed to respond to UNCLOS mandates. To participate in activities of public awareness about sustainable management of oceans related activities.

Achievements in 2002 IOC supported the 2nd International Meeting, "Acting Together for the Future of the Blue Planet", organised by Nausicaa-Centre National de la Mer (Boulogne, December 2002). As a result of this meeting almost 120 organizations representing museums and aquaria, environmental and educational NGO's with a potential public of some 200 million each year in five continents have committed to implement an international action plan to inform, educate and make people aware of the oceans, their richness and their sustainable use.

Main Line of Action 1: Reducing scientific uncertainties about coastal and global ocean processes in the context of marine ecosystems

DESCRIPTION: IOC has been addressing, through its Ocean Science Programme, critical scientific uncertainties in relation to the management and sustainable use of the marine environment and the ocean's role in global change by facilitating, promoting and coordinating appropriate research and related capacity-building activities. New perspectives in marine environmental protection require new integrated approaches in research as well as management. An interdisciplinary science approach involving the understanding of coupled chemical, biological, physical, global and coastal ocean processes in an ecosystem context is now essential. The major challenge is the development of scientific mechanisms for an ecosystem approach to the management of marine and coastal environments, including fisheries. As an integral part of this challenge, there is an urgent need to develop robust, useful indicators of the health of ocean ecosystems.

STRATEGY : The Ocean Science Programme will be developed further to address global interdisciplinary science issues and to provide specifically an enlarged knowledge base on the response of ocean ecosystems to human-induced and natural changes in the chemical and physical environment, including those induced by climate change and variability. The IOC Ocean Science Programme will: (i) participate in and co-sponsor global programmes that address a wide spectrum of scientific issues related to the ecosystem approach to the management of marine and coastal environments; (b) investigate specific scientific issues that require in-depth study by convening study groups, panels and small ad hoc groups that are sponsored either jointly with the existing or emerging global programmes or initially by IOC alone; (c) ensure that all of its activities are pertinent to regional concerns and involve participation of scientists from developing nations; (e) further strive for all its activities to respond to the scientific needs of the international global and regional conventions and programmes; and (f) globally disseminate the scientific knowledge base thus developed through reports, publications, symposia, Internet-based web-sties, workshops and training activities. In the framework of the Integrated Coastal Area Management (ICAM) programme and other IOC programmes addressing coastal issues (such as harmful algal blooms (HABs) and Coral Reef Monitoring), intersectoral projects will be developed in the area of water resources in coastal regions, integrated river basins management, the use of ICAM approaches to coastal biosphere reserves, and the development of coastal urban pilot projects, together with IHP, MAB, CSI, and MOST.

RESULT: **Gaps and weak links are identified in the present carbon cycle observation system, scientific solutions for filling of these gaps are developed for GOOS and the global research community**

International and intergovernmental cooperation in monitoring, modelling, assessing, and forecasting ocean and climate conditions were facilitated. A Background Report on A Global Ocean Carbon Observation System is published (GOOS Report No. 118; IOC/INF 1173), WOCE Atlases for each ocean basin marking the end of this 10 year ocean observation programme is also published,; and a web site for a watching brief on CO2 sequestration in the ocean is developed.

Achievements in 2002 The Integrated Global Carbon Observation Theme is in final revisions and should be published in mid-2003. The Watching Brief is available on the CO2 Panel web site. The Brief is updated monthly with news and references to peer-reviewed scientific articles. IOC and SCOR will co-host an international symposium on ocean carbon sequestration, to be held in 2003.

RESULT: Research, monitoring and assessment for improved understanding of the responses of the marine ecosystem to global change are facilitated

A significant progress has been achieved on linking physical indices to pelagic fish stocks. A GEF Targeted Research programme on climate change impacts on coral reef ecosystems was initiated jointly with the World Bank. Significant progress was achieved in developing indicators for the health of benthic communities. A programme was initiated through TTR with a specific focus on the complex systems such as cold seeps, hydrothermal vents. Understanding of the factors regulating the dynamics of HABs in the context of physical and chemical forcing, ecosystem dynamics and human influences are improved and the GEOHAB science plan was finalized. The work of the IOC/SCOR Working Group on Quantitative indicators for Fisheries Management progressed satisfactorily; an international symposium on ecological indicators will be held from 31 March to 3 April 2004, at the UNESCO Headquarters in Paris. The IOC formed a Working Group that will develop the next generation global models to forecast the effects of human activities on nutrient inputs to coastal marine ecosystems.

Achievements in 2002 Production of a comprehensive IOC/GLOBEC review and scientific framework for the use of environmental indices to help hindcast/nowcast and forecast changes in the abundance and distribution of pelagic fish in selected areas will be available in 2003. A Web-site with a Database on marine benthos and environmental conditions from selected coastal areas of the world will be available in 2003 which will also encompass guidelines and recommendations on use of indicators in monitoring programs. The GEOHAB Implementation plan will be finalized in 2003. The working group on nutrient inputs to coastal marine ecosystems will publish its first results in 2003. IOC further cooperated with the Large Marine Ecosystem Programme as one of its sponsors.

RESULT: Capabilities of Member States for ICAM increased through studies of human communities and ecosystem interactions, in coastal areas, and in particular in coastal urban environments

Several ICAM guidelines are published. In cooperation with LOICZ three regional BASINS studies have been compiled and published in 2002, they include Africa, South America, and The Caribbean region. Pilot site implementations have started in Africa (Senegal, Morocco, Kenya, Tanzania) in November 2002. A global synthesis on coupled interdisciplinary dynamical processes in the coastal oceans was initiated. This will be published in 2004 as the volumes 13 and 14 of THE SEA.

Achievements in 2002 The IOC Guide No.42 on Methodological approaches to ICAM has been published in 2001 and widely disseminated. Originally in French, an English and a Spanish version were published in 2002. A guide on Submarine Ground water discharges in the Coastal Zone will be published at the beginning of 2003 together with IHP. A new series focusing mainly on the aspects of coastal area management is being created as the ICAM Dossiers. The first issue will be addressing the Role of Indicators for ICAM, to be expected in January 2003.

Main Line of Action 2: To further develop, within the GOOS and GCOS, the monitoring and forecasting capabilities needed for the management and sustainable development of the open and coastal ocean

DESCRIPTION: The IOC, leading a partnership with WMO, UNEP and ICSU, began implementing GOOS in 1998. GOOS is part of an Integrated Global Observing Strategy (IGOS), with the space agencies of the world as partners. GOOS has an open ocean subsystem to improve weather and climate forecasting, and a coastal one to provide information needed to manage and restore healthy coastal ecosystems and living resources; forecast and mitigate the effects of natural hazards; enable safer and more cost-effective marine operations; and protect public health. The open ocean one is the ocean component of GCOS, which is co-sponsored by IOC, UNEP and FAO and led by WMO. GOOS produces data and information meeting the needs of many users. It has subsystems for observations, data communications and management, and modelling and applications. The growing observation network comprises remote-sensing from satellites; coastal instruments including tide gauges; buoys, drifters and other platforms; ships of opportunity (including commercial ferries); and long time series records of variability. The initial GOOS incorporates existing operational elements. It is growing by developing pre-operational pilot projects to demonstrate utility and cost-effectiveness; building capacity for developing countries; stimulating enabling research; and interacting with users to determine the most useful products. Much of the application of GOOS will take place through the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). The development and implementation of monitoring and forecasting capabilities needed for the management and sustainable development of the open ocean and coastal seas will assist with Eradication of Poverty and the development of New Information and Communication Technologies as follows: (i) the development and implementation of forecasting systems will improve short and long term prediction of precipitation (hence water supply) on the adjacent land, with profound implications for terrestrial ecosystems; (ii) the monitoring of living marine resources will facilitate the management, preservation and sustainable development of marine ecosystems, so enhancing the scientific basis for the protection of the environment and sustainable use of natural resources; (iii) the monitoring of natural variations and the effects of human activities on the marine environment and ecosystems of the coastal ocean will contribute to sustainable development, including human health, and safe and efficient marine operations, for coastal and island states; (iv) the monitoring and forecasting of natural hazards such as hurricanes, cyclones, typhoons, storm surges and tsunamis will contribute to the development of mitigation strategies for mostly poor coastal communities in developing countries, helping to diminish poverty; (v) the integration of marine data collected in situ, and remotely sensed from satellites, and the assimilation of these data into forecasting models will demand vast improvements in the capacity and coordination of data and information management and communication systems.

STRATEGY: Strategy: The strategy includes the implementation of pilot projects to demonstrate and validate the GOOS concept; the involvement of more developing countries in the implementation of GOOS; a better ability of regional groups of countries to participate in and benefit from GOOS; an expanded implementation by incorporating national activities; and solicitation of increased extra-budgetary support. In the context of natural disaster prevention, a special effort will be made to develop intersectoral activities relating to prevention of ocean-induced hazards affecting coastal communities, through investment in El Nino forecasting and the reinforcement of tsunami warning systems. Because the design of the open ocean component of GOOS by the Ocean Observations Panel for Climate (OOPC) is jointly shared with the World Climate Research Programme (WCRP), the activities of the OOPC, including its work on the Global Ocean Data Assimilation Experiment (GODAE) and the Argo profiling float Pilot Project, are dealt with under the climate element of Main Line of Action I. Results expected at the end of the biennium: Growth of the observing system, especially through the advent of more national contributions; Improvement in the scope, quality and timeliness of products and services for the

wider community; · Successful development of pilot projects designed to test new elements of the observing system; · Expanded regional GOOS programmes tied closely to UNEP regional programmes; · Improved approach to ocean data management.

RESULT: **The Global Ocean Data Assimilation Experiment (GODAE), and the Argo expanded project to use profiling floats for a first-time global collection of upper ocean thermal and salinity data, through projects in all oceans**

The Global Ocean Data Assimilation Experiment is designed to test the ability of the community to integrate in situ and remotely sensed ocean data and assimilate them into advanced numerical models to accurately represent the behaviour and present state of the ocean at a fine scale, and to forecast its future behaviour globally. One key element of GODAE is the Argo profiling float programme, which will seed the ocean with 3000 profiling floats to measure the temperature and salinity of the upper 2000 metres of the ocean and transmit the data back to base by satellite, as the basis for the first ever truly global monitoring of subsurface ocean properties. These data are essential to improve ocean and climate forecasts.

Achievements in 2002 The first GODAE conference was held in Biarritz in June 2002 and attracted 250 attendees, demonstrating the size of this new community. Many new advances were reported. The new Internet servers for GODAE provided by the US and France are working well, and provide access to data and products. GODAE Strategic and Implementation Plans have been published on the web, and the GODAE Bureau in Melbourne is working well. There are already 500 Argo floats in the water and commitments have been made by funding agencies to enable the planned total of 3000 to be reached within the 2003-2005 time period. Funds have been obtained for the Argo Coordinator, employed by IOC, who now works in the JCOMMOPS centre in Toulouse. The Argo Science team is steering the project.

RESULT: **Implementation of an ocean carbon observing system**

To provide carbon data in support of climate studies and climate forecasts it has been agreed that there should be a global carbon monitoring programme for the ocean. Carbon observations are beginning to be made by ships and buoys, and plankton observations of the ocean surface (representing carbon) are being made by ocean colour sensors on satellites. These data are being brought together with terrestrial data through an Integrated Global Carbon Observing Theme by the IGOS Partners.

Achievements in 2002 Plans for the carbon observing system have been published on the GOOS web site. Ships are making carbon observations along selected tracks. Plans have been agreed for a network of times series stations at which carbon measurements will be made at buoys or by ships over long time scales (decades)

RESULT: **Publication of the integrated coastal GOOS design to guide Member States in GOOS implementation**

The Coastal GOOS design plan is intended to describe an end-to-end monitoring and forecasting system for coastal seas, to guide Member States in implementing GOOS in coastal waters

Achievements in 2002 The design plan was completed in September 2002, and published in initial form on the GOOS web site. It was circulated for comment by the scientific community, and comments have now been integrated into the final version, which is now being edited prior to publication in hard copy and on the Web in 2003.

RESULT: **Expansion of GOOS by incorporating appropriate parts of national observing systems**

Many nations collect ocean observations. Some of these observations may be valuable for use in the global ocean observing system, so individual countries are being asked to donate (or make available) relevant datasets or data subsets to be exchanged as part of the GOOS.

Achievements in 2002 A contractor has been hired to work at the Global Observing Systems Information Centres (GOSIC) at the University of Delaware to collate national information that is

relevant for the GOOS.

RESULT: **Expanded access to and application of remote-sensing technology as a contribution to building the capacity of developing countries to participate in and benefit from GOOS**

Remote sensing of the ocean surface by a wide and growing variety of sensors on orbiting satellites is a fast growing source of ocean information. It is important that developing states make as much use as possible of this data, which is obtained by satellite overflights of their territories. Many Member States do not realise what is available, and/or have limited access to it. GOOS is working with the space agencies and nations concerned to improve access to these data and provide training in their use to produce products useful for decision makers.,

Achievements in 2002 The GOOS-AFRICA proposal for the African Process is directed in part at increasing access to and training in the use of remotely sensed data. The GOOS Capacity Building Panel has made access to and training in the use of remotely sensed data one of the key elements of its strategy. IOC has decided to use as a key element of its capacity building programmes (including for GOOS) the UNESCO Bilko programme for providing learning about the interpretation of remotely sensed data. As affiliates of CEOS and Members of the IGOS partnership, IOC and GOOS are working with the space agencies to improve access and training.

RESULT: **Fully tested GODAE models ready to assimilate Argo data between 2003-2005**

See also result 1. GODAE models are being developed for example through the French MERCATOR project

Achievements in 2002 Good progress is being made for example in developing models of the Atlantic by the French MERCATOR project, results of which are available weekly on the Internet.

RESULT: **A functioning set of coastal GOOS pilot demonstrator projects**

The coastal panel will develop and implement with Member States a functioning set of coastal GOOS pilot demonstrator projects

Achievements in 2002 Plans for these projects have been developed as part of the Coastal GOOS Design Plan. Implementation is likely to begin in 2003.

RESULT: **Effective functioning of JCOMM in support of GOOS goals**

JCOMM will oversee the operation of key elements of the GOOS Initial Observing System, including:(i) the PIRATA project, whose buoys collect data from the equatorial Atlantic for to weather and climate forecasting in Brazil and west Africa;(ii) the TAO project, whose buoys are part of the ENSO observing system that underpins forecasts of El Nino; (iii) the GLOSS project, whose sea level gauges collect data to calibrate satellite altimeters, and to underpin climate forecasts;(iv) the Ship of Opportunity Programme (SOOP) implementation panel, whose ships collect subsurface data along shipping lines;(v) the Data Buoy Cooperation Panel, whose members deploy drifting buoys to collect upper ocean and meteorological data worldwide. JCOMM will convert design advice from OOPC into practical guidelines for the implementation of met-ocean services by Member States, working through groups on marine climatology, services, maritime safety, wind waves and storm surges, sea-ice, ship and buoy observations, and sea-level observations (via the GLOSS programme). JCOMM will convert OOPC advice on data management into reality through its data management coordination group, which will advise on actions required to implement, maintain and make available to users a fully integrated high quality ocean/atmosphere data stream. JCOMM will also plan, initiate and implement a capacity building programme, by implementing the JCOMM Capacity Building Strategy.

Achievements in 2002 The JCOMM Management Committee met in February 2002 to plan JCOMM developments. The various JCOMM subgroups on observations, data, products, and capacity building also met during the year. Each produced plans to improve specific JCOMM operations, and began implementing them. The 35th IOC Executive Council in June 2002 approved the recommendations made at JCOMM-1 in Iceland in June 2001. The JCOMM Operations Centre in Toulouse continued to improve the provision

of services on ship and buoy and float data to the wider community.

RESULT: Effective functioning of the newly formed regional GOOS bodies

There are a number of GOOS regional bodies with specific interests in a common body of water. The GOOS Project office works with them to ensure that they can function effectively and are developing according to GOOS Principles so as to contribute to the overall global observing system.

Achievements in 2002 Some of the regional bodies are much more advanced than others, for example those around Europe and the United States, and require little or no attention. Most effort has gone into building GOOS in the Caribbean, the Mediterranean, the Black Sea, the Indian ocean, the Pacific islands region, and southeast Asia.

RESULT: Creation of an initial GOOS for the Indian Ocean

It was considered necessary to get all Indian Ocean nations working together to observe the Indian ocean in a coordinated manner, so as to enable all to benefit from a common pool of information.

Achievements in 2002 The IOC Perth (GOOS) Office played a key role in bringing together the Indian Ocean GOOS countries, building on previous successful meetings in Perth and Delhi. The key event for the year 2002 was the convening of the first Indian Ocean GOOS Conference, which took place in Mauritius (November 4-9, 2002), and at which the MOU on IOGOOS was signed by 9 nations.

Main Line of Action 3: To further develop and strengthen the IODE system as a global mechanism to ensure open and full access to ocean data and management of relevant information for all

DESCRIPTION: The IOC's International Oceanographic Data and Information Exchange (IODE) was established in 1961 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. Over the past 40 years the IODE system has developed into a worldwide network of over 60 Designated National Agencies, National Oceanographic Data Centres, Responsible National Oceanographic Data Centres and ICSU's World Data Centres. This network has been able to collect, control the quality of, and archive millions of ocean observations, and has provided services for its users in the Member States. At the IOC the IODE programme is managed by the Ocean Services Section. A second component of the Ocean Services Section concerns Ocean Mapping. The main goal of the Ocean Mapping Programme (OMP) is to cover the world ocean with bathymetric and geological/geophysical charts in order to provide decision-makers, scientists and a wide range of users with information about bottom relief and geological parameters of the open part of the World Ocean and in exclusive economical zones. OMP products provide a useful framework for many IOC programmes. The third component of the Ocean Services section concerns the International Tsunami Warning System (ITSU) and other IDNDR-related activities. Tsunamis are a threat to life and property to all coastal residents living near the ocean. Since the establishment of the Tsunami Warning System in the Pacific, dozens of destructive tsunamis took place in the Pacific and its adjacent seas resulting in significant casualties and/or property damage. The IOC efforts in natural disaster warnings are based on the principle of disaster prevention through utilizing modern technology in collecting seismological and hydrological data and disseminating it rapidly to the most remote places, increasing public awareness and managing potential risks.

STRATEGY : In recent years new technologies have evolved that will enable the data centres to offer better, more comprehensive and faster services and products to its growing user communities. The application of these technologies to oceanographic data and information management requires the development of sophisticated new applications and standards. Whereas IOC has provided substantial support, through its TEMA component of IODE, to assist developing countries in the establishment of national oceanographic data and information exchange facilities, the "digital divide" between developing and developed countries requires a rapid response by the IODE programme to ensure developing countries can actively and fully participate in the evolving knowledge society. IODE will help establish, maintain and strengthen cooperation with ocean research and monitoring programmes to ensure that data and information needs of these communities are met. This will also involve collaboration with operational oceanography programmes such as GOOS and the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). Global data and information heritage will also be safeguarded by ensuring a continuous archival and availability of these data and information.

RESULT: **IODE: Effective and easily accessible systems for submission of, and access to ocean data and information**

It includes: -Effective and easily accessible systems for the submission of data by scientists (or by data collection instruments) to the IODE system- Effective and easily accessible systems for data access by users (scientists and others)- Assistance by IODE data centres to scientists in the development of data and information management plans at the science project planning level- Assistance by IODE data centres to scientists in the planning and implementation of data products- Effective involvement of the IODE data centre community in the scientific programme development ensuring a comprehensive data management plan- Improved global network of ocean data centres facilitating access to data, metadata and information by the widest possible range of users- Implementation and further development of

projects such as GODAR, GTSP, ASFA, GLODIR, SSSL.

Achievements in 2002 The MEDI software application has been finalized, enabling scientists to describe data sets that they have collected into a metadata system. This metadata system can be searched and data can be retrieved from the holding data centre.

IODE data centres provide assistance to scientists in the development of data and information management plans at the science project planning level on a continuing basis. As part of the IODE capacity building programme starting data centres are trained in assisting scientists in the development of management plans;

IODE data centres provide assistance to scientists in the planning and implementation of data products on a continuing basis. As part of the IODE capacity building programme starting data centres are trained in assisting scientists in the development of products.

Three (3) new data centres have been established in 2002. The support to the implementation and further development of projects such as GODAR, GTSP, ASFA, GLODIR, SSSL has continued in 2002

RESULT: IODE: Ocean data and information capacity building to ensure access for all

It includes: - Establishment and strengthening of additional oceanographic data and information centres, especially in developing countries- Training of oceanographic data and information managers, especially in developing countries through specialized group training activities or individual travel/study grants (internships)- Development of 'Ocean Data and Information Networks' (ODIN) in the different regions, following the successful model already being implemented in Africa within the framework of the ODINAFRICA project (2000-2004). - Provision of internet access to oceanographic data and information centres in developing countries- Comprehensive CD-ROM and Internet based 'IODE OceanTeacher' as a training tool and self-training support system for Oceanographic data and information management capacity building- Additional National Oceanographic Data Centres, especially in developing countries, with trained staff, required equipment and Internet access

Achievements in 2002 Three (3) new data centres have been established in 2002 as part of the ODINAFRICA network; The ODINCARSA project has started.

Four (4) training courses have been held in Africa, 2 in the Caribbean and South America and one in Iran.

Internet access to oceanographic data and information centres in developing countries has been provided within the framework of the ODINAFRICA project.

OceanTeacher development has continued and has received wide acclaim;-

RESULT: IODE: Global referral system for ocean data and information

The OceanPortal is a global referral system providing links to thousands of web sites and related documents relevant to ocean data and information. The system will provide not only a catalogue of URLs of such web sites but will also include a searchable index of the web sites content. Submissions to the catalogue will be quality controlled by experts.

Achievements in 2002 OceanPortal has continued its development reaching 3500 sites in December 2002. OceanPortal will be adopted by IAMS LIC as a major web reference tool in 2003. The GEMIM will revise the category scheme of OceanPortal in 2003.

RESULT: IODE: Regional ocean community portals

Global Community Portals will be developed for Africa, Caribbean and South America and Western Pacific, focusing on ocean science, services and management. The IODE programme will coordinate portal content for ocean data and information related content and will provide technical backstopping for content relevant to the other IOC sections. This is a cross-cutting project in UNESCO

Achievements in 2002 At the end of the biennium it is expected that the African OceanPortal will be a comprehensive and dynamic source of information on management and sustainable development of coastal areas in Africa. It is expected that various partners, at the local, national, regional and international level will provide content on a regular basis

related to their ocean and coastal activities in Africa. The OceanPortal for the Caribbean and South America regions will be developed in cooperation with the Ocean Data and Information Network for the Caribbean and South America regions (ODINCARSA) project. Accordingly the focus countries will initially be the 15 IOC Member States cooperating in this project. Thematically the Portal will concentrate on management and sustainable development of the coastal. The training course for both, African and Caribbean/South American groups, was held on 13-17 May 2002.

RESULT: OCMAP: regional bathymetric charts

Development of 6 regional international bathymetric charts such as IBCM, IBCWP, IBCWIO, IBCEA, IBCCA, and IBCAO as a contribution to GEBCO- information concerning the relief of the World Ocean and its geological/geophysical parameters provided to decision-makers and scientists

Achievements in Progress was made as planned.

2002:

RESULT: ITSU/IDNDR: Tsunami warning system development

- Further strengthening of the tsunami warning system in the Pacific to become effective for the Pacific, as well as local tsunamis.- Development of new tsunami warning systems in other regions based on the experience gained in the Pacific.- Continuation of co-operation with IUGG and ICSU, as well as with ISDR in the area of tsunami mitigation.- Improve capabilities of Member States in the tsunami preparedness.

Achievements in 2002: Support to the International Tsunami Information Centre (ITIC) was provided in 2002. The centre produced several well received information products (brochures, newsletters).- The International Workshop on "Local Tsunami Warning and Mitigation" was held in Petropavlovsk-Kamchatskiy, Russia, September 10 - 15, 2002- A mission of a Chilean Tsunami was sponsored on the development of national tsunami plans in Colombia and Ecuador- A special web site on the ITSU programme was developed in 2002 (<http://ioc.unesco.org/itsu>) and hosted at the IOC Secretariat- A draft project proposal: Intra-Americas Sea Tsunami Warning System: Education, Warning, Management and Research was developed