Over the last century, long term sea level change has been estimated from tide gauges in spite of their poor spatial distribution. In Africa, the sea level continuous record are very short (less than 20 years generally). The occurrence of the major tsunami in the Indian Ocean on 26 December 2004, and its aftermath demonstrated the urgent need to have an operational network of sea level. The Intergovernmental Oceanographic Commission (IOC) of UNESCO in collaboration with the Flanders Government has initiated the development of the Ocean Data and Information Network for Africa (ODINAFRICA).

ODINAFRICA is collaborating with the Global Sea Level Observing System (GLOSS), the Indian Ocean Tsunami Early Warning and Mitigation System (IOTWS), the University of Hawaii Sea Level Centre (USA), and the Proudman Oceanography Laboratory (United Kingdom) to develop a pan African Network of sea level stations, consisting of tide gauges spaced along the Africa coast, providing data near real time, and addressing the key oceanographic phenomena. Additional oceanographic sensors would be installed at selected locations. Training on installation and maintenance of equipment, as well as analysis and interpretation of data would be provided to technicians and scientists.

EXISTING TIDE GAUGES DATA SETS AND DATA ARCHAEOLOGY

A questionnaire has been developed and sent to all African national contacts involved in the ODINAFRICA programme. The preliminary investigation based on the questionnaire reveals the following:

- Not all existing gauges in Africa region are operational, especially along the gulf of Guinea
- Poor or non-existence of communications facilities for data transmission and exchange.
- There is a considerable amount of tide gauge data in hard copy and non-computer form.

Figures 2, 3 and 4 show that the sea level derived from tide gauges could constitute a valuable complement to Jason validation.

The stations planned for installation are:

- West Africa gauges: Nouachott, Dakar, Limbe, Takoradi and Pointe Noire
- East Africa gauges: Nosy Be, Fort Dauphin, Moroni and Djibouti

LIST OF THE STATIONS IDENTIFIED FOR INSTALLATION/UPGRADE BY OTHER PARTNERS

- IOTWS/GLOSS: Mombasa, Lamu (Kenya)
- BCLME: Lamberts Bay (South Africa), Luderitz and Walvis Bay (Namibia), Namibe and Luanda (Angola)
- SHOM (France): point des Galets-La Reunion, Dzaoudzi – Mayotte (France), Tamatave (Madagascar)

ODINAFRICA will install OTT Kalesto tide gauges. The choice of location for the tide gauges will be based on several considerations such as: sites security (in terms of vandalism and position of the gauge relative to activities at the site), platform stability, time series continuity, availability of local technicians. The countries receiving the equipment will provide: (i) tide gauge house, (ii) electricity and telephone at site, (iii) free and unrestricted access to the data collected by the equipment, and (iv) assistance to help in facilitating the installation.

Tide gauge location at Dakar, Senegal

Location of existing tide stations on African coastline

- Most of the stations are not associated with the meteorological basic parameters.
- Maintenance capacity for tide stations is low in Africa.
- There are differing types of gauges in the region.
- Not all gauge stations are GLOSS stations.
- African stations capable of delivering data in fast mode via telephone or satellite or other fast means to GLOSS are located in South Africa, Sao Tome, Mozambique and Kenya.

OTT Kalesto radar tide gauge installed in Pemba Harbour, Mozambique (similar gauges will be installed by ODINAFRICA)

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ODINAFRICA is playing a key role in developing capacity for ocean data management in Africa. Also, data types managed in ODINAFRICA have been gradually increased.

- Five new countries i.e., Algeria, Angola, Congo, Egypt and Namibia joined the ODINAFRICA network in ODINAFRICA-III. The goal of ODINAFRICA is to ensure that all coastal African countries have the basic capacity in ocean and coastal data management, and well established management structures for such data. The new Data Managers underwent an intensive training to provide them the basic skills and knowledge. The training workshop took place in Oostende, Belgium, in April 2005. Additionally, Data Managers from the previous group who needed remedial training joined this course.

- Biodiversity data are important in understanding the health status of our environment, and for sustainable development. Management of marine biodiversity data was included in ODINAFRICA-III. To ensure successful incorporation of these data, ODINAFRICA is developing the required basic capacity. Two training workshops on marine biodiversity data management were organized in Oostende, Belgium, in April 2005 and Grande Baie, Mauritius in August 2005.

- Development of good quality data products based on stakeholders requirements and whenever possible of regional scale is being emphasized in ODINAFRICA-III. Emphasis is also on ensuring that these products are available online. One such product is MEDI Africa that includes all MEDI records of ODINAFRICA countries. It was completed in April, 2005 and is available online at the ODINAFRICA webpage.

- ODINAFRICA-III is also emphasizing on all Data Centres to have own WebPages. This will increase their visibility as well as of ODINAFRICA. Additionally, Data Centres could use the websites to provide some of their services to stakeholders and to publicize their data products and services. To facilitate this, a one week training workshop on Webpage Development was conducted in December 2005 in Oostende, Belgium, and was attended by 15 participants.

- The ODINAFRICA network which is a member of the IODE network actively participated in the Eighteenth Session of the International Oceanographic Data Exchange (IODE-XVIII), in April 2005 at Oostende, Belgium. It was represented by five countries i.e., Tanzania, Tunisia, Senegal, Madagascar, and Mozambique.

- ODINAFRICA III is also emphasizing on all Data Centres to have their own WebPages. This will increase their visibility as well as of ODINAFRICA. Additionally, Data Centres could use the websites to provide some of their services to stakeholders and to publicize their data products and services. To facilitate this, a one week training workshop on Webpage Development was conducted in December 2005 in Oostende, Belgium, and was attended by 15 participants.

- ODINAFRICA Data Managers is planned as a refresher to enable them catch up with changes in data management. The OceanTeacher training package and data archaeology focusing on but not limited to regional scale is being emphasized in ODINAFRICA-III. Emphasis is also on ensuring that these products are available online. One such product is MEDI Africa that includes all MEDI records of ODINAFRICA countries. It was completed in April, 2005 and is available online at the ODINAFRICA webpage.

- An advanced training course for the old ODINAFRICA Data Managers is planned as a refresher to enable them catch up with changes in data management. The OceanTeacher training package and resource kit has changed substantially in the last two years. It is therefore necessary to introduce Data Managers to the new version.

- ODINAFRICA is developing a programme for ocean data archaeology focusing on but not limited to sea-level data. This will be done in close collaboration with the Data Centres.

Several other activities are planned within the framework of ODINAFRICA data management. They include:

- ODINAFRICA intends to assimilate hydrological data into its network. Currently a survey to assess the status, availability and accessibility of these data in ODINAFRICA countries is going on. The aim is to find the best way to implement this.
One of the goals of ODINAFRICA is to build capacity for development of, and providing access to information products and services for a better management of marine and coastal environment and resources in Africa. This has been implemented through the following:

- Development of union catalogue of libraries of institutions participating in ODINAFRICA: AFRILIB
- Repository of marine related publications from about Africa (OdinPubAfrica)
- Bibliographic search and document delivery services
- Directory of marine and freshwater professionals from Africa (AFRIDIR)
- Provision of software and equipment for libraries of marine institutions
- Provision of training for librarians and documentalists
- Provision of marine information management training course:
- Full text literature on Marine sciences and oceanography in AFRICA through ODINAFRICA Repository.

AFRIDIR: DIRECTOR OF MARINE AND FRESHWATER PROFESSIONALS FROM AFRICA

Contents of AFRIDIR
- Information resources and services of international organizations, regional bodies and national institutions and organizations in Africa related to aquatic areas.
- More than 900 hundred Marine and freshwater professionals and approximately 300 institutions from 33 African countries have already registred to AFRIDIR through OceanExpert;

Information in AFRIDIR?
At the individual Level:
- Surname (+Firstname), Job Title, Job Type;
- Organization, Organization’s Acronym, Department, Organization Type
- Address, City, State, Country, Phone, fax, email, URL
- Description of activities of the Experts (keywords);
- Geographic (marine, freshwater, brackishwater);
- Geographic Descriptors relevant to the Experts’ activities
- Subject Descriptors (grouping of professionals into subject areas)
- Citations of most important and/or most recent papers from the Experts

At the Institutional Level:
- Organization’s Name, and Acronym;
- Organization Type
- Head of Organization, Name and Title
- Address, City, State, Country, Phone, fax, email, URL
- Description of current and main activities of the Institution (include year of establishment, focus, major achievements, etc)
- Geographic Descriptors relevant to activities Entered on your own your information by clicking: How to enter information in AFRIDIR? or Enter on your own your information: http://www.iode.org/oceanexpert/addRecord.php?new=1

How to find people in AFRIDIR?
Go to: http://www.oceanexpert.org

AFRIDIR is also accessible through the ODINAFRICA web site: http://www.odinafrica.org

AFRILIB: THE UNION CATALOGUE OF 25 MARINES LIBRARIES FROM AFRICA

With AFRILIB:
- Get online access to more than 12 000 bibliographic references (Book, journal articles, theses) on marine science in Africa.
- Request for document delivery from the library holder
- Ease to use: search by title, Author, library
For more information visit: http://193.191.134.12/afrilib/

Afrilib serves as a tool for dissemination of literature, as well as a facilitating exchange of documents in the African network

Content

Services
- Online access to more than 12 000 marine information records;
- Access to Primary Information via Document delivery Request;
- Borrow document through Interlibrary loan system;
- Make Personalised list of favourite publications;
- Online help.

Entering AFRILIB records at the Institut Mauritanien de Recherches Oceanographiques et des Pêches, Nouadhibou, Mauritania

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The Ocean Data and Information Network for Africa (ODINAFRICA) brings together marine related institutions from twenty five (25) Member States of the Intergovernmental Oceanographic Commission of UNESCO from Africa (Algeria, Angola, Benin, Cameroon, Comoros, Congo, Cote d’Ivoire, Egypt, Gabon, Ghana, Guinea, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, South Africa, United Republic of Tanzania, Togo, and Tunisia).

The network has assisted the Member States to establish and operate National Oceanographic Data and Information centres, and in particular: to get access to data available in other data centres, develop skills for manipulation of data and preparation of data and information products, and develop infrastructure for archival, analysis and dissemination of the data and information products. Each of the participating institutions has developed a suite of data and information products that have been quality controlled, merged and availed through project website (www.odinafrica.org). These include: Directories of marine and freshwater professionals, Catalogues of marine related data sets, Marine Species data base for Eastern Africa, Library catalogues, catalogue of marine related publications from about Africa.

The objectives of the current phase of ODINAFRICA is to improve data flows into the national oceanographic data and information centres in the participating countries, develop data and information products required for integrated management of the coastal areas of Africa, and increase the delivery of services to end users. The following are the thematic work packages being implemented:

Coastal Ocean Observing System: focuses on upgrading and expanding African network for in-situ measurements and monitoring of ocean variables especially sea level, provision of near real-time observations of ocean variables, and building adequate capacity for collection, analysis and management of sea-state variables. ODINAFRICA will install/upgrade at least 12 tide stations (Nouakchott - Mauritania, Dakar - Senegal, Limbe - Cameroon, Takoradi - Ghana, Pointe Noire - Congo, Nosy Be and Fort Dauphin - Madagascar, Maputo - Mozambique, Djibouti - Djibouti, Alexandria - Egypt, Cap Bon - Algeria and Agadir - Morocco). Additional stations will be installed/upgraded by other organisations such as the Global Sea Level Observing System and the Indian Ocean Tsunami Early Warning and Mitigation System – GLOSS/ITWS, the Benguela Current Large Marine Ecosystem project BCLME and the French Service Hydrographique et Océanographique de la Marine - SHOM.

Data and Information Management: focuses on further development and strengthening of National Oceanographic Data Centres (NODC) to manage data streams from the coastal ocean observing network, upgrading infrastructure in the NODCs (including internet access and computer systems), integrating biogeographic and hydrological data streams into NODC systems, Building capacity for data and information managers for new NODCs established as part of this project, and Rescue historical data (especially sea level data).

Product Development and end user communication and information delivery: focuses on identification of end users of marine/coastal data/information products and their requirements, identification and development of set of core products to be prepared by each NODC, development of Regional and National Marine Atlases, improvement of atmospheric and oceanic monitoring databases, promotion and dissemination of outputs of the project to all stakeholders, and assessment of the impacts of products on the end-user.

ODINAFRICA INSTITUTIONS

<table>
<thead>
<tr>
<th>Country</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Algeria</td>
<td>Institut des Sciences de la Mer et de l’Aménagement du Littoral, Algèr, Algérie</td>
</tr>
<tr>
<td>Angola</td>
<td>Instituto Nacional de Investigação Pesqueira, Ministério das Pecas, Luanda, Angola</td>
</tr>
<tr>
<td>Benin</td>
<td>Centre de Reches Hauteutiques et Océanologiques du Bénin, Cotonou, Bénin</td>
</tr>
<tr>
<td>Cameroon</td>
<td>Specialized Centre for Marine Ecosystems Research, Agricultural Research Institute for Development, Kribi, Cameroon, Université de Douala, Douala, Cameroon</td>
</tr>
<tr>
<td>Comoros</td>
<td>Centre National de de Documentation et de Recherches Scientifiques, Moroni, Comoros</td>
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<tr>
<td>Congo</td>
<td>Le Centre IBD de Pointe-Noire</td>
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<tr>
<td>Cote d’Ivoire</td>
<td>Centre de Reches Océanologiques</td>
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<tr>
<td>Egypt</td>
<td>National Institute of Oceanography and Fisheries</td>
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<tr>
<td>Gabon</td>
<td>Direction Générale du Droit de la Mer</td>
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<tr>
<td>Ghana</td>
<td>Marine Fisheries Research Division, Directorate of Fisheries, Ministry of Food &amp; Agriculture, Tema, Ghana</td>
</tr>
<tr>
<td>Guinea</td>
<td>Centre de Recherche Scientifique de Conakry -Rogbore, Conakry, Guinea</td>
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<tr>
<td>Kenya</td>
<td>Kenya Marine and Fisheries Research Institute, Mombasa, Kenya</td>
</tr>
<tr>
<td>Madagascar</td>
<td>Institut Halieutique et des Sciences Marines, Université de Tolitza, Tulear, Madagascar</td>
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<tr>
<td>Mauritania</td>
<td>Institut Mauritain de Recherches Océanographiques et des Pêches, Nouadhibou, Mauritaine</td>
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<td>Mauritius</td>
<td>Mauritius Meteorological Services, Mauritius, Albion Fisheries Research Centre</td>
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<td>Morocco</td>
<td>Ibn Zohr Université, Agadir, Morocco Université Mohammed V, Rabat, Morocco</td>
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<tr>
<td>Mozambique</td>
<td>Instituto Nacional de Hidrografia e Navegacao, Maputo, Mozambique</td>
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<tr>
<td>Namibia</td>
<td>National Marine Information and Research Centre, Swakopmund, Namibia</td>
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<tr>
<td>Nigeria</td>
<td>Nigerian Institute for Oceanography and Marine Research, Lagos, Nigeria</td>
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<tr>
<td>Senegal</td>
<td>Centre de Recherches Océanographiques de Dakar, Thièye, Dakar, Senegal</td>
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<tr>
<td>Seychelles</td>
<td>Seychelles Fishing Authority, Mahe, Seychelles Islands</td>
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<tr>
<td>South Africa</td>
<td>Directorate of Marine and Coastal Management, Cape Town, South Africa</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Institute of Marine Sciences, University of Dar Es Salaam, Zanzibar, Tanzania</td>
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<tr>
<td>Togo</td>
<td>Centre de Gestion Intégrée du Littoral et de l’Environnement, Université de Lomé, Lomé, Togo</td>
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<tr>
<td>Tunisia</td>
<td>Institut National des Sciences et Technologies de la Mer, Salammbô, Tunisie</td>
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WHAT IS ODINPUBAFRICA?
http://iodeweb1.vliz.be/odin/

OdinPubAfrica is the name of the OdinAfrica e-Print Service - a service, which will provide a growing database of research literature from Marine Science and Oceanographic Research Centers in Africa.

- E-prints are electronic copies of any research output (journal articles, book chapters, conference papers etc even multimedia). They may include unpublished manuscripts and papers.
- An e-Print archive is an internet based repository of such digital scholarly publications which can provide immediate and free worldwide access benefiting both author and reader.
- The service provides a simple mechanism for enabling the information managers of the institutes to deposit it for the authors their research output (assisted archiving).
- In OdinPubAfrica every participating institute will have her own webpage with her own collections of documents.
- It provides a complementary service to traditional catalogues and learning resources.

WHY DEPOSIT YOUR RESEARCH IN ODINPUBAFRICA?

- To make your research more visible and available
- To promote your work and that of other academics within the community of African oceanography and marine science.
- To use it as a secure store for your research publications - which can help you to respond to the many requests for full text and publication data
- To contribute to national and global initiatives which will ensure an international audience for your latest research (other universities are developing their own archives which, together, will be searchable by global search tools).

HELP AND BACKGROUND INFORMATION
ASSISTANCE OU INFORMATION
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