This document is intended to provide a starting point for the discussions to be held by the sessional working group on the Future of the IODE programme. The sessional working group will be invited to address this wide ranging issue also taking into consideration and contributing to agenda items 8.2, 8.3 and 8.4:

- 8.2: The IOC strategic plan for oceanographic data and information exchange 2013-2016
- 8.3: Changes in the IODE structure
- 8.4: IODE quality management framework

1 Historical background of IODE

Formally the IODE started out as a Working Group on Oceanographic Data Exchange which was created by the First IOC Assembly (19-27 October 1961) through Resolution I-9. The Working Group became a Working Committee in 1973 through Resolution VIII-31, adopted by the 8th Session of the IOC Assembly (5-17 November 1973). IODE, as well as its parent IOC were established in the aftermath of the International Geophysical Year (IGY), an international scientific project that ran between 1 July 1957 and 31 December 1958. It marked the end of a long period of the Cold War when scientific collaboration was very difficult. 67 countries participated in the IGY. The IGY encompassed 11 earth sciences: Earth sciences: aurora and airglow, cosmic rays, geomagnetism, gravity, ionospheric physics, longitude and latitude determinations (precision mapping), meteorology, oceanography, seismology and solar activity. In addition to IOC and its IODE, the IGY also “spawned” SCOR (Scientific Committee on Oceanic Research) in 1957. From its first annual meeting at Woods Hole Oceanographic Institution in 1957, SCOR identified the Indian Ocean as the greatest unknown in the global ocean and an area that could benefit from an intensive campaign of ocean observations. This led to the International Indian Ocean Expedition (IIOE).

Within the context of IOC the IODE was established in 1961 to manage the huge amounts of data that were expected from the IGY and IIOE.
IODE’s purpose (1961) was 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.

Structurally the IODE system formed a worldwide service oriented network consisting of DNAs (Designated National Agencies), NODCs (National Oceanographic Data Centres), RNODCs (Responsible National Oceanographic Data Centres) and WDCs (World Data Centres – Oceanography). The DNAs could be seen as “NODCs under development”. The RNODCs dealt with either specific data types (eg waves) or regions (eg WESTPAC). However the RNODC category has been abolished. The WDC was a structural element of the ICSU World Data Centre network. IODE collaborated with the WDCs Oceanography of which there were 3 (Silver Spring, Obninsk, Tianjin) + WDC-MARE, which operated outside IODE. The WDC system was replaced by the World Data System (WDS) in 2010/2011. The main role of the WDC within IODE was to ensure the long-term secure archival of data (the system of 3 WDCs Oceanography was supposed to provide sufficient redundancy in the case of a global catastrophe). The WDC system was replaced by the World Data System (WDS) which was created by the 29th General Assembly of ICSU in 2008.

During the period 1961-2012 a total of 80 IOC Member States have established National Oceanographic Data Centre (NODCs).

In addition to dealing with oceanographic data management and exchange, the IODE (since the early 1980s) also covers marine information management (information is defined here as textual information, e.g. scientific literature as the outcome of scientific research). However this has not led to the development of a network of “marine information centres” in parallel to the NODCs.

Within IOC the IODE is a programme. It is governed by the IODE Committee, which is a primary subsidiary body of the IOC which reports directly to the IOC Governing Bodies (IOC Assembly or IOC Executive Council). Generally the Sessions of the IODE Committee are held every two years. Members of the IODE Committee are the IODE national coordinators for oceanographic data management and IODE national coordinators for marine information management (both individuals designated by their Government and during the last years by the Directors of their Institutes to reduce bureaucratic processes). In cases where an NODC has been established the IODE national coordinators for oceanographic data management is usually the Director of the NODC.

| The IODE Programme is owned by its stakeholders and can only function if these stakeholders participate actively in the governance and activities of the Programme. |

2 Terms of Reference of IODE
The main objectives of the IODE Programme are:

(i) to facilitate and promote the exchange of all marine data and information including metadata, products and information in real-time, near real time and delayed mode in compliance with the IOC Oceanographic Data Exchange Policy;
(ii) to ensure the long term archival, management and services of all marine data and information;

(iii) to promote the use of international standards, and develop or help in the development of standards and methods for the global exchange of marine data and information, using the most appropriate information management and information technology;

(iv) to assist Member States to acquire the necessary capacity to manage marine data and information and become partners in the IODE network; and

(v) to support international scientific and operational marine programmes of IOC and WMO and their sponsor organisations with advice and data management services.

(Note that the IODE objectives were updated to the above version during IODE-XVIII, through Recommendation IODE-XVIII.1 and during IODE-XXI, through Recommendation IODE-XXI-4- see below).

3 Terms of Reference of the NODC

The terms of reference (tasks) of the NODC are defined in IOC Manuals and Guides No. 5 (Guide for Establishing a National Oceanographic Data Centre). The 2nd revised edition was published in 2008.

The mission of a National Oceanographic Data Centre is to provide access and stewardship for the national resource of oceanographic data. This effort requires the gathering, quality control, processing, summarization, dissemination, and preservation of data generated by national and international agencies. The full range of data management tasks to be carried out by a national oceanographic data management “system” can be summarized as follows:

- receiving data from national, regional and international programmes collecting oceanographic data;
- verifying the quality of the data (using agreed upon standards);
- ensuring the long term preservation of the data and associated information required for correct interpretation of the data; and
- making data available, nationally and internationally.

National Responsibilities include:

1. Receiving data from researchers, performing quality control, and archiving;
2. Receiving data from buoys, ships and satellites on a daily basis, processing the data in a timely way, and providing outputs to various research and engineering users, forecasters, experiment managers, or to other centres participating in the data management plan for the data in question.
3. Reporting the results of quality control directly to data collectors as part of the quality assurance module for the system.
4. Participating in the development of data management plans and establishing systems to support major experiments, monitoring systems, fisheries advisory systems;
5. Disseminating data on the Internet and through other means (and on CDROM, DVD, etc);
6. Publishing statistical studies and atlases of oceanographic variables.
7. Providing indicators for the different types of data being exchanged in order to track the progress.

International Responsibilities include:

1. Participating in the development of international standards and methods for data management through the IODE and JCOMM;
2. Participating in international oceanographic data and information exchange through the IODE and JCOMM, the Joint Commission for Oceanography and Marine Meteorology;
3. Assisting with data management aspects of global or regional programmes or pilot projects through IODE and JCOMM and in the framework of, inter alia, the IOC’s Strategic Plan for Oceanographic Data and Information Management;
4. Operating as a data assembly and quality control centre for part of an international science experiment;
5. Operating regional, specialized or World Data Centre (WDC) on behalf of the international science community.

4 Programme Structure of IODE

Over the past 5 decades the IODE programme has grown considerably in size, structure and coverage. As mentioned before there are two core areas of substance: these are oceanographic data management, and marine information management. Until very recently these have developed largely independent of each other.

In terms of structure we already mentioned the IODE Committee. The Committee elects 2 Co-Chairs who Chair meetings of the Committee (until 2007 there was one Chair and one Vice-Chair). During the inter-sessional period the IODE programme is managed (in cooperation with the Secretariat) by the IODE Offices. The IODE Officers include the Co-Chairs, the Chairs of the IODE Groups of Experts (see below) and the Chair of the JCOMM Data Management Coordination Group (since 2007). In the past the Officers also included Directors of relevant ICSU WDCs but that ended with the end of the WDC system.

IODE Groups of Experts are small groups that provide expert advice to the IODE Committee. To compose the Groups of Experts, the IOC/IODE Secretariat, at regular intervals, invites the IOC Member States to nominate suitable (on the basis of the Terms of Reference of the Group and of the Agenda of the next planned meeting) candidates for the Groups. The strategy and structure of these Groups was revised last at IODE-XIX (2007). IODE currently has 4 GEs:

1. IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GEBICH)
2. IODE Group of Experts on Marine Information Management (GEMIM)
3. Joint JCOMM/IODE Expert Team on Data Management Practices (ETDMP)
4. IODE Group of Experts on the Biogeographic Information System (GE-OBIS)

In accordance with the IOC rules, cost of participation in meetings of GEs is covered by IOC or by Member States.

In addition there are also IODE Steering Groups. Their task is to manage the implementation of an IODE project. These projects can have global geographic or or
regional coverage. Each Steering Group elects its own membership (based upon required expertise) and Chair(s). Participation in meetings of Steering Groups should be covered by the Project (if it concerns an extra-budgetary project), by IOC or by Member States.

The Global projects that are managed by a SG are GTSP, GOSUD, OceanTeacher, IODE Ocean Data Portal, OceanDocs and OBIS.

The Regional projects are the Ocean Data and Information Networks (ODINs): ODINAFRICA, ODINCARSA-LA, ODINECET, ODINBlackSea, ODINWESTPAC, ODINPIMRIS.

The IODE Secretariat administers the overall management of the IODE programme, in close consultation with the IODE Officers, Chairs of the Groups of Experts and Chairs of the Steering Groups. Since August 2007 the Secretariat is fully based at the IOC Project Office for IODE in Oostende, Belgium (the Office was formally established in April 2005 but officially the Secretariat remained at IOC HQ in Paris until August 2007)

An overall structural diagram of the elements of IODE is provided in Figure 1.

![Figure 1: Structural diagram of IODE](image)

5 Collaboration with other organizations

As mentioned before, when IODE was established in 1961, this also started the close collaboration with the ICSU WDCs. Data therefore flowed from the data collection (research cruise) through the NODCs to the WDCs for long-term archival. All NODCs were supposed to utilize the same formats and standards (including QC) so the WDCs could easily merge the data into the global database. As previously mentioned, the ICSU WDCs system was replaced by a World Data System (WDS) and IODE has been accepted as a “network” member (under the concept of constituting a community of practice for ocean data and information).
Many of IODE’s projects were not “owned” only by IODE. Many were developed and implemented jointly with other entities. GODAR was joint IODE-ICSU WDC, GTSPP was joint with IGOSS, GOSUD with OOPC, etc.

A special case is JCOMM: The partnership with the Intergovernmental Oceanographic Commission of UNESCO (IOC) and the World Meteorological Organization (WMO) for JCOMM officially started in 1999, when the Technical Commission was established. Prior to 1999, marine meteorological and oceanographic observations, data management and service provision programmes were international coordinated through the WMO Commission for Marine Meteorology (CMM) on one hand and through the joint WMO-IOC Committee for the Integrated Global Ocean Services System (IGOSS) on the other hand. While enhancing safety at sea remained the primary objective of marine forecast and warning programmes, requirements for data and services steadily expanded in volume and breadth during the preceding decades. Other applications, such as coastal area management, optimization of commercial fishing activities, ship routing, offshore resource exploration and development, pollution prevention and clean-up and, most recently, climate modeling and prediction, became increasingly important. Moreover, many of these applications required observational data sets and predicted products for both the oceans and the overlying atmosphere.

Responding to these interdisciplinary requirements necessitated the development of ever closer working relationships between oceanographers and marine meteorologists. This was reflected at the global level by growing collaboration between IOC and WMO in organizing and coordinating ocean data acquisition, data management and provision of related services. As formally constituted, JCOMM is an intergovernmental body of experts that provides the mechanism for international coordination, regulation and management of oceanographic and marine meteorological observing, data management and services systems. The creation of this Joint Technical Commission results from a general recognition that worldwide improvement in coordination and efficiency may be achieved by combining the expertise and technological capabilities of WMO and IOC. One of the primary initial priorities for JCOMM is the development and implementation of operational oceanography, on the basis of designs and requirements expressed by the Global Ocean Observing System (GOOS) and the Global Climate Observing System (GCOS), including in particular an operational ocean observing system for climate.

IODE collaborates with JCOMM through the JCOMM Data Management Programme Area (DMPA) and its JCOMM/IODE Expert Team on Data Management Practices (ETDMP). The DMPA is managed by the JCOMM Data Management Coordination Group. The IODE Co-Chair (one of the two Co-Chairs) is a member of the DMCG. There have been some suggestions in the past to merge IODE into JCOMM but this suggestion has not been accepted.

Collaboration between IODE and other IOC programmes has not been particularly successful. Nevertheless some cooperation has been established in recent years: with the Harmful Algal Bloom (HAB) programme, and with the Integrated Coastal Area Management (ICAN) programme. Offers to collaborate with the tsunami programme were not welcomed. Cooperation with GOOS was not welcomed during the past 10 years but recent discussions indicate an improvement. Collaboration with the capacity development programme of IOC has also been minimal.
6 What has changed for IODE?

Between 1961 and the early 1980s the computer technology required for ocean data management was large and expensive and thus centralized in specialized institutions (e.g. NODCs). Exchange of data was possibly only by using magnetic tapes or other physical data carriers. The 1980s witnessed the birth of the PC which heralded the era of portable computing. Not only became computers portable but they became affordable. In the 1990s followed the development of the World Wide Web and Internet. This made it possible for computers to communicate and thus exchange of data became instantaneous. These major changes happened over a period of 2 decades. One of the side effects of the “computing power for all” was that the computing power necessary to manage and process data was now available to all, not only the NODCs. Research projects, either national, regional or international are now able to manage their own data and even make these available to their users. This has resulted in a considerable increase in data volume (which the NODCs may not necessarily manage) but also the development of many parallel data networks (in addition to the IODE network). IODE is no longer the only player.

A second element of change was the development of operational oceanography (GOOS) in the late 1980s that dealt with real-time data. Until then data management focused on delayed-mode data (e.g. data collected during research cruises). The ability to make data available in (near) real-time required different data management systems. Many NODCs were not able to accommodate this operational aspect. The IOC GOOS programme was developed in parallel to IODE and very few links were established until the creation of JCOMM.

A third element of change is the changed geopolitical landscape. The United Nations was established in 1945, immediately after the Second World War, to stop wars between countries, and to provide a platform for dialogue. UNESCO, as one of its many specialized agencies, was established in 1946. For decades the United Nations was the only global forum. It is also important to note that in the UN one member state has one vote, regardless of GDP or population (but we add that the assessed contribution of each member state is based on GDP). Europe was still fragmented and attempts to unify would take until 1958 when the European Economic Community (EEC) would be established between 6 countries. The biggest change came in the 1990s with the adoption of the Maastricht Treaty and Treaty of Lisbon. Today the European Union includes 27 countries and 500 million inhabitants. The European Union has become very active in defining science policy and research. In the field of ocean research and related data management there have been many projects during the past two decades. In recent years these included SeaDataNet 1 and 2. The next major initiatives are Marine Knowledge 2020, which will be spearheaded by the European Marine Observation and Data Network (EMODNET). All European NODCs have been partners in SeaDataNet and will participate in EMODNET. Also other regions (Caribbean, WESTPAC) have witnessed the development of regional coordinating bodies, especially those that are economy driven. Many of these have also driven ocean research and many projects have been implemented. Some regional projects are already establishing collaborative links with other regions.

A fourth element is financial: the impact of the 2008 financial crash in the United States has rippled through the global economy and most IOC Member States have started cutting budgets as from 2009-2010. This has had a negative impact on especially non-earmarked extra-budgetary contributions to the IOC. At the same time the budget cuts at the national level have impacted negatively on the NODCs and on marine libraries. In the European context many NODCs now rely heavily on the funds obtained through projects like SeaDataNet, EMODNET etc. To this we now need to
add the impact of the decision by the USA to cease its financial contributions to UNESCO (as from November 2011). For IOC and its IODE this resulted in a 80% operational budget cut. Within IODE the cut was felt mostly in the regional ODIN projects. At the same time we have witnessed an increase in requests for funding to attend IODE related meetings.

7 What has changed for the NODCs and marine libraries and how active are our communities in IODE at the global level?

7.1 Responses to the national report survey (test of responsiveness of stakeholders)

At the time this document was prepared 52 of the 84 (62%) of the IODE national coordinators for data management (42 NODCs), and 31 of the 53 (58%) of the IODE national coordinators for marine information management responded to the IODE national reports 2011-2012 survey. (for 2009-2010 the percentages were 71% and 75% for DM and MIM respectively). The number of respondents has therefore decreased by more than 10%. The conclusions for MIM have to be taken with some reserves in view of the low number of responses.

If we count in terms of NODCs then only 42 of the NODCs responded (52.5%). In terms of response by region the below table shows the results: (note that Russian Federation has been included in E Europe):

<table>
<thead>
<tr>
<th>Region</th>
<th>NODCs in region</th>
<th>responses received</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe (+E Europe)</td>
<td>28</td>
<td>20</td>
<td>71.4%</td>
</tr>
<tr>
<td>Africa</td>
<td>21</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td>North America</td>
<td>2</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Latin America</td>
<td>11</td>
<td>6</td>
<td>54%</td>
</tr>
<tr>
<td>Caribbean Isl</td>
<td>6</td>
<td>1</td>
<td>16.6%</td>
</tr>
<tr>
<td>W Pacific</td>
<td>7</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Indian Ocean/PersG</td>
<td>5</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>80</strong></td>
<td><strong>42</strong></td>
<td><strong>52.5%</strong></td>
</tr>
</tbody>
</table>

**Conclusion:** Europe has the highest response rate. The Caribbean Islands region has the lowest response rate, followed by Africa and the Indian Ocean/Persian Gulf region. The poor response rate of Africa is surprising in view of the success of ODINAFRICA.

7.2 Staffing levels at the NODCs and marine libraries

For 55% of the NODCs staffing levels have remained the same since 2009-2010 and for 17% it has increased. For only 5% of the NODCs staff has decreased.

For 41% of the marine libraries staffing levels have increased, while for 37.5% staffing has decreased. Further analysis revealed no geographic pattern.

**Conclusion:** Overall NODC staffing has remained at the same level or increased as compared to 2010-2011.
7.3 Operational budget of the NODCs and marine libraries

For 21% of the NODCs the annual operational budget is between US$ 1,000 and US$ 10,000; for 27% of the NODCs the annual operational budget is between US$ 10,001 and US$ 50,000. For 44% of the NODCs the budget has remained the same as in 2009-2010; for 23% the budget has increased, while for 21% it has decreased. So for only 1 in 5 NODCs the budget has decreased.

Surprisingly 33% of the marine librarians was not aware of their operational budget. For 20% the budget is between US$1000 and US$ 10,000; for 16.7% it is between US$ 10,001 and US$ 50,000. For 43% of the marine libraries the budget remained the same as in 2009-2010; for 20% it increased while for 16.7% it decreased. So for only 1 in 6 marine libraries the budget has decreased.

From the survey results we can only conclude that the NODCs and marine libraries do not display an overall decrease in resources (staff and funding) during the past inter-sessional period.

Conclusion: Overall NODC operational budget has remained at the same level as compared to 2010-2011.

7.4 Participation of NODCs and IODE national coordinators for MIM in IODE global meetings (workshops, groups of experts,...)

The IODE programme can only be viable if the NODC staff actively participate, on a voluntary basis, in the global activities of the programme (in addition to performing national NODC duties).

The below table lists participants in meetings (workshops and other meetings) organized by IODE in 2011 and 2012 (training courses are NOT included). Names in bold are staff of IODE NODCs; Names underlined are IODE national coordinators for MIM or staff of the MIM NC institution. People representing other organizations are not included.

The table shows that experts from 27 IOC Member States participated in IODE meetings in 2012. Of the 27 countries, 21 of the experts were representatives of an IODE NODC and 4 were IODE national coordinators for MIM. In terms of NODC participation we therefore conclude that of the 80 NODCs, 26% participated in IODE global expert meetings in 2012, and only 7.5% of the IODE national coordinators for MIM.

QUESTION 1: why is there any increase in requests for sponsoring to participate in IODE meetings when the NODC budgets seem to have remained stable?

QUESTION 2: why is participation of MIM national coordinators in IODE meetings so low?
In regional terms (country representation):

<table>
<thead>
<tr>
<th>Region</th>
<th>#NOCs in region</th>
<th>NOCs involved</th>
<th>%</th>
<th>MIM NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe (+E Europe)</td>
<td>28</td>
<td>9</td>
<td>33.3%</td>
<td>2</td>
</tr>
<tr>
<td>Africa</td>
<td>21</td>
<td>4</td>
<td>20%</td>
<td>1</td>
</tr>
<tr>
<td>North America</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>1</td>
</tr>
<tr>
<td>Latin America</td>
<td>11</td>
<td>1</td>
<td>9%</td>
<td>0</td>
</tr>
<tr>
<td>Caribbean Isl</td>
<td>6</td>
<td>1</td>
<td>12.5%</td>
<td>0</td>
</tr>
<tr>
<td>W Pacific</td>
<td>7</td>
<td>3</td>
<td>43%</td>
<td>0</td>
</tr>
<tr>
<td>Indian Ocean/PersG</td>
<td>5</td>
<td>1</td>
<td>25%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>21</td>
<td>26%</td>
<td>4</td>
</tr>
</tbody>
</table>

The regional distribution analysis shows that North America is the most active region, followed by the Western Pacific region. Latin America, the Caribbean and Africa are not actively participating in global IODE meetings and related activities.

**QUESTION 3:** Why is participation of NODCs in Latin America, Caribbean and African region in IODE meetings and related activities so low?

**QUESTION 4:** Are countries in Latin America, the Caribbean and African region interested in participation in IODE? If so then what is IODE not doing well?

**IOC Member States participating in IODE meetings in 2012**

- **Argentina**: Ariel Troisi; Raul Guerrero
- **Australia**: Greg Reed; Ann Gronell Thresher; Tony Rees; Paul Tildesley
- **Barbados**: Ramon Roach
- **Belgium**: Marc Goovaerts; Francisco Hernandez, Heike Lust, Serge Scory; Bruno Danis; Klaas Deneudt, Anton Van de Putte; Leen Vandeputte; Bart Vanhoorne, Nabil Youdjou
- **Canada**: Mary Kennedy, Mathieu Ouellet, Laure Devine, Tobias Spears, Sylvain de Margerie
- **China**: Du Qiongwei, Shao Hua Lin, Ting Yu, Jixiang Chen, Fengying Ji
- **France**: Thierry Carval, Loïc Petit de la Villéon
- **Germany**: Friedrich Nast; Martina Plettendorff, Stephan Heckendorff, Reiner Schlitzer
- **Greece**: Sissy Iona, Sarah Faulwetter
- **India**: Pattabhi Rama Rao, Narayananane Saravanane, Venkat Sheshu Reddem
- **Italy**: Stefano Nativi, Alessandra Giorgetti, Matteo Vinci
- **Japan**: Yutaka Michida; Toru Suzuki; Katsunori Fujikora; Mizuho Hoshimoto; Shiro Ishizaki; Shoichi Kizu, Satoshi Ogawa; Akihiro Seta; Katsuhiko Tanaka
- **Kenya**: Paul Oloo, Ednah Okundi, Nina Wambiji
- **Korea Rep.**: Sung Dae Kim
- **Madagascar**: John Bemiasa
- **Netherlands**: Taco de Bruin; Dick Schaap
- **New Zealand**: Kevin Mackay
- **Russian Fed.**: Sergey Belov; Nick Mikhailov
- **Senegal**: Anis Diallo
- **South Africa**: Ursula von St Ange
- **Tunisia**: Malika Bel Hassen-Abid; Saida Messaoudi
- **Turkey**: Nihayet Bizsel
- **Ukraine**: Olga Akimova; Sergey Konovalov; Richard Lisovsky; Oleksandra Sergeyeva; Denys Slipetsky; Vladimir Vladymyrov
- **UK**: Gwen Moncoliffe, Adam Leadbetter
- **USA**: Kenneth Casey; Mark Formwall; Hernan Garcia; Linda Pikula; Lisa Raymond; Charles Sun; Scott Woodruff, Robert Arko, Krisa Arzayus, Francis Bringas, Cyndy
8 Successes and failures of the ODINs

There is general agreement that ODINAFRICA has been a success: over the past 20 years African Member States have evolved from having no NODCs to having more than 20 NODCs that are collaborating and implementing joint spin-off activities. In addition ODINAFRICA has paved the way for the new IOC Sub-Commission of Africa.

QUESTION 5: Has ODINAFRICA led to an increase in available funding for Africa marine research institutions?

However as shown in the previous section the success of ODINAFRICA in building data and information management capacity in Africa is not leading to an increased participation of Africa in the global activities of IODE.

Following the success of ODINAFRICA, other regions decided to embark on similar initiatives: ODINCARSA-LA, ODINCINDIO, ODINBlackSea, ODINECET, ODINPIMRIS and ODINWESTPAC. As part of the ODIN development training was provided to hundreds of students through OceanTeacher. However none developed in any way similar to ODINAFRICA. Part of the reason could of course be the lack of the same level of financial support from a donor but is this the only reason?

In the Caribbean region the development of the Caribbean Marine Atlas has been slow and a few countries have dropped out. It has been noted that the main reason is the low number of experts in the small island states. This results in a heavy work load and thus lack of time to work on the Atlas, despite the general agreement on its use. In addition management is not always well aware of the usefulness of the Atlas.

QUESTION 6: Why are the ODINs not developing more successfully?

QUESTION 7: Do the regions still see the need for ODIN development and if so, what should be done to make this happen?

QUESTION 8: If the success of ODINs is heavily dependent on financial resources then how can these be mobilized?

QUESTION 9: How can development of regional coastal atlases such as the Caribbean Marine Atlas be promoted taking into account the limited human expertise available?

9 Future of OceanTeacher

There is general agreement that OceanTeacher and OceanTeacher Academy have become excellent platforms for the management of expertise as well as the organization of technical training related to ocean data and information management. Since the establishment of the IOC Project Office for IODE in April 2005, nearly 2000 students from over 120 Member States have been trained. In order to assess needs
for both data and information management an online “IODE Training Needs assessment” survey has been organized every year since 2009. In 2009 this resulted in 135 responses for data management, and 121 for information management. In 2011 the same survey received 51 responses for data management and 59 for information management. In 2012 the survey obtained only 30 responses for data management and 15 for marine information management. This seems to indicate a drop in interest for the IODE training activities.

QUESTION 10: What are the reasons for the drop in responses to the online training surveys?

QUESTION 11: If training is still needed then what should be the priorities for the next 2 years?

QUESTION 12: Should training be provided in Oostende only or should training also be organized at the regional level (at training centres) or should it be provided online?

10 How relevant is the global IODE programme to the needs of the NODCs and Marine Libraries?

QUESTION 13: Is there still a need for an IODE network of data centres and marine libraries?

QUESTION 14: What is the niche of IODE? (what is the competitive advantage of IODE in the current ecosystem of ocean data networks?)

QUESTION 15: Should IODE limit its current scope of action/interests?

QUESTION 16: Who are the stakeholders of the global IODE programme today?

QUESTION 17: What communities should be served by IODE that are not served today and how can IODE engage these communities?

QUESTION 18: How well is IODE and its NODCs connected to the ocean research and observation communities? How can we improve this connection?

QUESTION 19: How well is IODE connected to the ocean research and observation communities? If needed, how can we improve this connection?

QUESTION 20: What are the needs of the NODCs that are not being addressed by IODE today?

QUESTION 21: What are the needs of Marine Libraries that are not being addressed by IODE today?

QUESTION 22: What should be the priority activities of IODE (for both data management and for marine information management) in the next five years?
QUESTION 23: Should IODE play a more active role in JCOMM?

QUESTION 24: Should IODE become a programme of JCOMM (and thus cease to exist as an independent programme within IOC)?

QUESTION 25: Taking into account the previous questions and conclusions what operational structure should IODE use and how should it operate within IOC and between IOC and other organizations?