The OceanTeacher Global Academy
Executive Summary

The **OceanTeacher Global Academy Project** will develop a global training centre network and utilize this network to increase national capacity in coastal and marine knowledge and management. It will do so by (i) promoting the establishment of Regional Training Centres as well as their close collaboration through advanced information technology; and (ii) further developing the OceanTeacher Learning System. The OceanTeacher Global Academy Project will build upon the achievements of the OceanTeacher Academy project which, between 2009-2013, developed a Learning Management System and teaching programme that has successfully organized 42 courses on ocean data and information management, involving over 1800 participants from over 100 countries, at the IOC Project Office for IODE in Oostende, Belgium. The OceanTeacher Global Academy project is funded by the Government of Flanders (Kingdom of Belgium) through the UNESCO/Flanders Funds-in-Trust for the support of UNESCO’s activities in the field of Science. Funding has been committed for the period 2015-2018. In addition funds are being identified through partnerships with a wide variety of partner organizations and projects.
1. SUMMARY

The OceanTeacher Global Academy will change training culture from a “north to south” model to north-south, south-south, and south-north. Whereas training was traditionally based on experts from developed regions to visit and teach developing country students, the OceanTeacher Global Academy will promote the expertise available in many developing regions.

Specifically, the OceanTeacher Global Academy will:

(i) Promote the establishment, and assist with the start-up, of Regional Training Centres that will plan, organize and implement training courses that are of relevance and serve needs within their region and teach these in locally relevant languages;
(ii) Promote the use of local experts as lecturers and training assistants by the Regional Training Centres;
(iii) Promote the collaboration between the Regional Training Centres by enabling (through advanced information technology) lecturers from multiple regions to contribute lectures;
(iv) Further develop the OceanTeacher Learning Management System to cover multiple IOC (and associate) programmes.

The new OceanTeacher Global Academy will build upon and expand the existing OceanTeacher Academy based at the IOC Project Office for IODE in Oostende, Belgium, to a truly worldwide training facility. It will provide a programme of training courses related to IOC programmes, contributing to the sustainable management of oceans and coastal areas worldwide, and relevant to Member States in the regions. A suitable governance structure will be created.

The OceanTeacher Global Academy will further promote collaboration and expertise exchange through new internet-based technologies such as video conferencing, video streaming etc. between the Regional Training Centres (RTCs).

1.1 Key Deliverables

1. Regional Training Centres established, operational and resourced locally (including infrastructure, processes and management) in, inter alia, Europe, Africa (IOC-Africa), Latin America & Caribbean (IOCARIBE), Indian Ocean (IOCINDIO) and Western Pacific (IOC-WESTPAC);
2. Virtual (video) classroom network installed and operational;
3. Competent resource persons available in all regions;
4. Well documented project governance structure established;
5. Courses organized and content provided through the OceanTeacher Learning Management System (OT LMS) and students trained in topics related to, inter alia, IODE, IODE/OBIS, IODE/ICAN, HAB, ICAM, GOOS, Tsunami, JCOMM, attended by students from one or more regions simultaneously;
6. Annual reports from Regional Training Centres on progress, including performance metrics;
7. OceanTeacher Global Academy widely recognized and utilized as universal platform for ocean related training and education.
1.2 Beneficiaries

The Project will target the following trainees/groups:
- Staff of marine research institutions and related facilities,
- Staff of Government departments involved with marine science, services and management,
- Marine related practitioners (Government and Private Sector),
- University students (marine science and related disciplines)

2. BACKGROUND

2.1 IOC’s new capacity development strategy

The IOC, in partnership with the Global Ocean Forum (http://www.globaloceans.org), made a voluntary Commitment at the Rio+20 conference on ‘Building Global Capacity for Marine Sciences, Observation and Transfer of Marine Technology’. This commitment aims at conducting a global and regional assessment of capacity development needs in the field of marine scientific research and ocean observation especially in developing nations and Small Island Developing States (SIDS), leading to the formulation and implementation of a global strategy to implement these needs, through partnership with countries, donors, UN Agencies, global financial institutions and the private sector. This commitment is based on the proposal contained in the UN Blueprint Report on Ocean and Coastal Sustainability and will be implemented in close cooperation with Global Ocean Forum led Voluntary Commitment on building global capacity for integrated ocean governance.

Extract from The future we want: Outcome of the United Nations Conference on Sustainable Development Rio+20 (2012)\(^1\)

160. We recognize the importance of building the capacity of developing countries to be able to benefit from the conservation and sustainable use of the oceans and seas and their resources and, in this regard, we emphasize the need for cooperation in marine scientific research to implement the provisions of the United Nations Convention on the Law of the Sea and the outcomes of the major summits on sustainable development, as well as for the transfer of technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology.

Further the aforementioned document states: “To enhance and expand IOC’s curriculum in technical training, the OceanTeacher programme will be:

(i) enhanced through the proposed OceanTeacher Global Classroom, which will involve the establishment, by Member States, of regional training centres (of Excellence) and their interconnection through advanced video conferencing services;
(ii) expanded through the development of a wide range of courses responding to needs in ocean science, ocean observation, tsunami warning and mitigation, integrated coastal area management, marine spatial planning etc. Special attention will be given also to North-South as well as South-South

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interaction of students, as well as to gender balance in terms of students and resource persons (lecturers and teaching assistants)."

(Note: at the time the IOC document was prepared, reference was made to “The Ocean Teacher Global Classroom”. This name has been modified to OceanTeacher Global Academy.

2.2 IODe’s Tradition in Capacity Development

One of the major objectives of the IODe Programme is to assist Member States to acquire the necessary skills to manage marine data and information and become full and equitable partners in the IODe network. It is only when IOC Member States have acquired this expertise at the national level that they can become an active partner in IODe and thus share their data and information with the other members of the "IODe family". The training does not only teach the principles of data and information management but also promotes the use of "international standards" amongst all IODe centres and thus achieve interoperability and data exchange.

Capacity building has been a cornerstone of the IODe (International Oceanographic Data and Information Exchange) Programme of the Intergovernmental Oceanographic Commission of UNESCO (IOC) since the programme’s inception in 1961. Between 1961 and 1997 the IODe capacity building programme was based upon four types of activities: (i) expert missions to Member States to advise on the establishment of national oceanographic data centres; (ii) organization of group training courses; (iii) support for internships in established national oceanographic data centres; and (iv) provision of equipment. This strategy was used for nearly four decades (1961-1997) and resulted in the successful establishment and operation of over 60 national oceanographic data (and information) centres in as many countries around the world. However, the programme had a few flaws: (i) the expert missions identified the capacity building requirements but IOC did not have the necessary financial resources to assist the visited Member States in a substantial way; (ii) training courses were not followed up by interaction with the trainees, nor was any support provided (e.g. equipment, feedback) to ensure that the acquired knowledge was applied. In the case of developing countries, the impact of IODe capacity building efforts was therefore often unsatisfactory and did not have long-term effects. An additional flaw was that no standard training curriculum existed and course materials were not archived.

Since the late 1990s IODe designed a new way to develop capacity in (developing) Member States. This new "strategy" was based upon these four elements:
- Working in a regional context, addressing common (regional) as well as individual (national) goals
- Providing equipment
- Providing training
- Providing seed funding for operational activities of newly created data centres and marine research libraries

This innovative strategic approach was called the Ocean Data and Information Network (ODIN) strategy. Together with the ODIN strategy, IODe started the development of an Internet-based training tool supplied with suitable contents, initially called the IODe Resourcekit (1997), later renamed to OceanTeacher (2001). IODe was the first programme in IOC to publish materials (the ResourceKit) on CD-ROM and using html for both content and user interface.
2.3 ODIN Strategy

The ODIN approach was applied first in Africa within the framework of the Ocean Data and Information Network for East Africa (ODINEA), co-funded by the Government of Flanders between 1997 and 1999 and covering IOC Member States in Eastern Africa and Indian Ocean Islands. The approach was successful and led to the development and implementation of the ODINAFRICA-II (2000-2003) and ODINAFRICA-III (2004-2008) projects that covered 20 (for ODINAFRICA-II) and 25 (for ODINAFRICA-III) IOC Member States in Africa respectively.

The success of the ODIN approach was such that other regions adopted the same strategy: ODINCARSA for the Caribbean and South America, ODINE CET for European Countries in Economic Transition, ODIN-Black Sea for the Black Sea region, ODINCINDIO for countries in the Indian Ocean region, and more recently ODIN-WESTPAC for Western Pacific countries and ODIN-PIMRIS for small Island Pacific States.

One of the core success elements of the ODIN strategy is the two-tier approach in terms of product and service development: ODIN projects deliver regional products and services (e.g. regional data bases and info bases) but each partner country also receives support to develop products and services that are specific to national or even local priorities and needs. This has led to a wealth of products developed at the national level going from research oriented taxonomic databases to “what do I find on the beach” brochures aimed at primary school children. This approach was found to maximise involvement and buy-in from the partner institutions and partner experts thereby optimising the potential for long-term sustainability of the established infrastructure and expertise.

2.4 OceanTeacher Learning Management System (OT LMS) 1997-2008

The purpose of the IODE Resource Kit was to provide an ‘NODC- In-A-Box’ capacity building tool for oceanographic data centres containing data and information management reference material and software tools useful for data centres. In 2001 it was agreed that the name ‘Resource Kit’ no longer appropriately described the content of the system as it now included both a set of software tools, as well as comprehensive training material. It was therefore decided to rename the system to “OceanTeacher” and a dedicated web site was established (see Figure 1). The archived site (5 May 2001) can be viewed on http://web.archive.org/web/20010505090918/http://oceanteacher.org/

Since its start OceanTeacher applied an innovative approach to the organization of its content, the so-called binary structure. This consisted of separating expertise resources from the courses and resulted in the so-called Resourcekit (the expertise or reference documentation) and the Training Manuals (the exercises and course paths). However, it is necessary to underline that, at the time, OceanTeacher was not...
intended to be a distance learning system, but was aimed to be an “assistant” or “tool” used during training courses organized by IODE in different Member States.

The rapid and exponential growth of content in the Resource Kit and the need for a more distributed approach to content submission and management led to the submission of a proposal aiming at expanding OceanTeacher into an open, modular and expandable expert and training environment. Initially using static html OceanTeacher gradually migrated to content management system (CMS) technology that allows multiple authors to work on the site. For further reading on OceanTeacher history please follow the link http://fust.iode.org/index.php/oceans/oceanteacher/oceanteacher-history.

2.5 OceanTeacher Academy Project 2009-2013

The Learning Management System

Within the framework of the OceanTeacher Academy Project (2009-2013), funded by the Government of Flanders under the FUST programme, considerable work was carried out to develop a “Learning Management System” (LMS) that incorporated a web-based training system primarily supporting Classroom training (face-to-face); it can also be used for online self-learning.

The OceanTeacher learning management system was initially developed as a training system for ocean data managers (working in ocean data centres), marine information managers (working in marine research libraries) as well as for marine researchers who wish to acquire knowledge on data and/or information management. In addition, OceanTeacher is increasingly being used for training in other related disciplines.

The homepage URL is http://www.oceanteacher.org (Figure 2)
The OceanTeacher learning management system has two main components:

- The OceanTeacher Courses (a collection of course outlines and courseware) (Fig 3)
- The OceanTeacher Digital Library (a collection of knowledge and resources) (Fig 4)

At the technical level, OceanTeacher uses the Semantic Mediawiki (SMW) (http://semantic-mediawiki.org/) for the digital library (resulting in an environment very similar to a managed Wikipedia) and Moodle (http://www.moodle.org), which is a general course management system (CMS). Both are open source software applications used and supported by a large community. Moodle allows the creation of fora and discussion lists, glossaries, online tests and quizzes, online submission of assignments by the students, and subsequent online grading by the teachers, amongst many other possibilities. Currently there are nearly 43,000 sites in 200 countries that utilize Moodle.
**The OceanTeacher Academy: Training Events**

The Courses and Digital Library are used together during a training event. Within the framework of the OceanTeacher Academy Project (2009-2013) the main activities included the development of the Courses and Digital Library, and the organization of classroom courses.

In addition, theoretical lectures were recorded (Slides + live image of lecturer) on video and made freely available through the open access site Vimeo ([http://vimeo.com/iode](http://vimeo.com/iode)), which could be used by the trainees to revisit the lectures they attended. The video lectures are also intended to promote OceanTeacher and attract new students (Figure 5).

Vimeo was chosen in 2009 as it was, at that time, the only video storage provider who did not limit duration (YouTube limited duration to 10 minutes at that time).

![Figure 5: sample OceanTeacher video](image)

Figure 6 shows the structure of the OceanTeacher learning management system components.

![Figure 6: OceanTeacher Learning Management System elements](image)
**Strengths and Weaknesses**

As described above, IODE started the systematic documentation of data and information management knowledge and expertise in 1998, which led to the development of the OceanTeacher platform. Initially courses were organized on site in various regions (Africa, Latin America). A major problem was soon revealed: in many locations the available Internet bandwidth and computer infrastructure was insufficient to support the training courses. It was then that the idea was born to establish an IODE training centre. Thanks to the financial support from the Government of Flanders it was possible, in April 2005, to establish the IOC Project Office for IODE in Oostende, Belgium. The Office includes a well-equipped training room with a capacity of 30 students and high capacity Internet (900 Mbps).

As from 2005 oceanographic data and information management courses were organized in Oostende. Each year approximately 8 courses are organized, resulting in an average of 200 trained students/year (see Figure 7). Between 2009 and 2013, again through support from the Government of Flanders, the training activity was complemented by the OceanTeacher web-based learning management system, described above. The training programme organized between 2009 and 2013 has enabled IODE to provide extensive training for most Member States that had already established an NODC as well as some that planned to establish such a facility. In a number of cases the training has led to the establishment of an NODC.

![IODE trainees](image)

**Figure 7: OceanTeacher students trained in Oostende per year**

Although the success of OceanTeacher has been widely recognized by Member States as well as other organizations we have also learned about a few inherent weaknesses:

1. Due to the limited budget as well as physical and human resource constraints we can invite only 1-2 students per country per course resulting in approximately 20 students/course + 2-4 lecturers/resource persons. This is a very small number, which does not ensure long-term sustainability in terms of national capacity. Several cases have been reported where individuals trained by OceanTeacher were soon after offered better jobs in a different institution (and sometimes in unrelated disciplines). We therefore need to aim at training more students in each country or better promote the transfer of knowledge to colleagues.
2. **Travel time** is excessive (15-20 hours) for students from some regions (e.g. Pacific Islands, Asia, Latin America). In the case of Small Island States in the Pacific (e.g. Fiji) travel time can even exceed 24 hours. This combined with the resulting jet lag and limited duration of the courses (usually 1 week long) makes that students cannot perform at their best.

3. **Language**: The use of English as the only working language remains a problem. English proficiency has been one of the selection criteria and this has limited participation from some regions.

4. While the ocean does not respect political borders, addressing local issues that affect local populations requires a local focus, using data at the appropriate resolution and involving local expertise. It is therefore appropriate to combine training of globally relevant topics with training on locally relevant issues as well as using local data and information that are relevant to local conditions.

5. While OceanTeacher Academy has been focusing mainly on “traditional” IODE topics we must recognize that today’s data and information management must closely link to society-relevant ocean and coastal management issues. This means that OceanTeacher should become an all-inclusive training environment not limited to data and information management but covering all areas of the IOC domain, while also focusing data and information management training on applicability in these additional domains, in particular serving regional projects.

These weaknesses will be addressed fully in the OceanTeacher Global Academy Project.

### 3. The OceanTeacher Global Academy Project

#### 3.1 Addressing the weaknesses of OceanTeacher Academy 2009-2013

- **IODE Associated Data Units (ADU) as new training stakeholders**

The OceanTeacher Academy has enabled IODE to provide training to a substantial number of Member States, reinforcing the expertise of existing or emerging National Oceanographic Data Centres as well as Marine Research Libraries. However it must be realized that data management is being carried out by more communities than the IODE NODCs. This was recognized by IODE-XXII (March 2013) leading to the establishment of a new IODE structural element, i.e. the Associate Data Unit (ADU). ADUs may be national projects, programmes, institutions or organizations (other than NODCs), or regional or international projects, programmes, institutions or organizations that carry out data management functions. There are potentially hundreds of ADUs.

- To ensure that data from these new ADU sources are re-usable globally and their data systems are interoperable, we must ensure that they use the same or comparable quality control procedures, the same metadata standards etc. Similar concerns need to be addressed by many other IOC programmes. This will be possible through organizing training using the OceanTeacher Global Academy.
• **Training more students in each country or better promote the transfer of knowledge**

  ➔ In order to increase the number of students trained the OceanTeacher Global Academy will establish Regional Training Centres. This will amplify the overall training capacity up to a factor 5 (if 5 such centres are established). An increased number of experts trained in each region should also counter “brain drain”.

• **Reduce travel**

  ➔ The establishment of Regional Training Centres will substantially reduce travel time for students and lecturers, as well as the associated travel costs.

• **Language**

  ➔ Each Regional Training Course will be able to use the working language(s) of the countries in their region. For Invited Lecturers providing a lecture in another language the Teaching Assistants may provide translation support.

• **Focus on local issues**

  ➔ Regional Training Centres will be able to focus on local issues that affect local populations or use data at the appropriate resolution and involve local expertise. This will make the training more relevant and more easily applicable to the students’ working environment.

• **All-inclusive training environment**

  ➔ The OceanTeacher Global Academy will offer an IOC wide training platform for all IOC programmes (and associated organizations). It will focus especially on projects that serve regional needs and have a training component.

### 3.2 Regional Training Centres (RTC)

The weaknesses described provide ample justification for the need to establish Regional Training Centres. The concept of the OceanTeacher Global Academy (still called Global Classroom at the time) was introduced at IODE-XXII: “The IODE Committee endorsed the concept of the OceanTeacher Global Classroom combining training in Oostende with training in Regional Training Centres and using advanced video communication. The Committee instructed the Secretariat to develop together with the Member States that have offered to host a Regional Training Centre, to prepare a project proposal for submission to suitable donors at the earliest opportunity.”
Regional Training Centre Candidate Countries

Following a presentation on the possible development of the OceanTeacher Global Academy at IODE-XXII (Ensenada, Mexico, 11-15 March 2013) a number of Member States expressed interest in hosting a Regional Training Centre:

EUROPE & NORTH AMERICA
1. Belgium (Oostende)

AFRICA
2. Kenya (Mombasa)
3. Mozambique (Maputo)
4. South Africa (Grahamstown)
5. Senegal (Dakar)

INDIAN OCEAN
6. India (Hyderabad)

WESTERN PACIFIC
7. China (Tianjin)
8. Malaysia (Terengganu)

LATIN AMERICA & CARIBBEAN
9. Argentina (Buenos Aires)
10. Colombia (Santa Marta)
11. Ecuador (Guayaquil)

Most of the candidate centres will be visited in 2014 to ascertain their suitability to host a RTC. Elements that will be taken into consideration are physical and technical facilities, event related services, human resources, relevant experience and history of the candidate centre, practical/legal issues and sustainability of the centre. Detailed terms of reference and minimum requirements to host a RTC have been prepared. All selected RTCs will sign a detailed agreement with UNESCO/IOC detailing their expected contributions. All RTCs will be subject to regular performance assessment.

Linking of Regional Training Centres

As indicated in the objectives one of the added values of the OceanTeacher Global Academy project will be the linking of RTCs through advanced information technology. In practical terms this means setting up video conferencing sessions between RTCs allowing the following processes:

- Lecturer in RTC1 to provide a lecture to students at his/her RTC and to stream this simultaneously to RTC2
- Lecturer in another location (institution or home) to provide a lecture via video conferencing to a selected RTC (or more than one)
- Enabling lecturers and students to share their display with other students and lecturers;
- Recording lecture sessions for re-use (preferably desktop + talking head)

This methodology will enable using lecturers in a more cost and time-efficient way as they do not need to physically travel to other locations. It also allows the use of multiple lecturers to provide short lectures (e.g., 1-2 hours), which would otherwise not be possible due to costly travel.
Limitations to this method are Internet quality and bandwidth but also the time zones in which the RTC and remote lecturers operate. Based upon initial experiments carried out between Oostende and Hyderabad in 2012 it was shown that the maximum time difference for courses that rely heavily on type (a) collaboration is 2 hours. Figure 6 shows compatible RTCs (e.g. Argentina-Colombia, Dakar-Oostende, Maputo-Oostende, Maputo-Mombasa, Oostende-Mombasa, Oostende-Maputo, Oostende-Dakar, Hyderabad-Malaysia, Tianjin-Malaysia).

![Figure 6: OceanTeacher Global Academy RTC timezones](image)

4. **OceanTeacher Global Academy subject area coverage and collaboration with other IOC programmes and Offices**

4.1 **OceanTeacher Global Academy Partners**

While the OceanTeacher Academy project (2009-2013) focused almost entirely on IODE ocean data and information management courses, the OceanTeacher Global Academy will also allocate funds for courses related to other marine related subject areas, on the condition that they have a data/information management element.

The Ocean Teacher has become an integral part of the new IOC Capacity Development strategy and the following IOC Programmes (in addition to IODE and its projects like OBIS, ICAN, …) and other Organizations have expressed interest in collaborating with the OceanTeacher Global Academy Project:

- **Ocean Sciences**
  - Integrated Coastal Area Management (ICAM)
  - Harmful Algal Blooms (HAB)
  - Global Large Marine Ecosystem (LME) project (funded by GEF, implemented by UNDP)
- Caribbean Large Marine Ecosystem project phase 2 (funded by GEF)
- African Centre for Capacity-Building in Ocean Governance (AfriCOG)
- Southeast Pacific data and information network in support to integrated coastal area management (SPINCAM) project

- Ocean observations and Services
  - International Oceanographic Data and Information Exchange (IODE)
  - Ocean Biogeographic Information System (OBIS) [part of IODE]
  - International Coastal Atlas Network (ICAN) [part of IODE]
  - International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC)
  - SeaDataNet II (funded by EU Commission)
  - Global Ocean Observing System (GOOS)
  - Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)
  - WMO (World Meteorological Organization)

- Tsunami warning and mitigation

- Capacity Development

4.2 OceanTeacher Global Academy Course types

In the OceanTeacher Global Academy the decision regarding suitable duration of courses will be left to the RTCs and the Steering Group taking into account the available budget and the needs of the course topic. Short-term courses will typically have a duration of 5 working days.

In terms of course type the RTCs are free to use different models:
- short-term courses with certificate of attendance
- short-term courses with certificate of successful completion (includes evaluation)
- university accredited module (within academic curriculum)
- university accredited summer school with diploma
- ...

Accreditation will depend on the mandate of the host institution of the RTC to issue academic qualifications. All RTCs will be requested to submit documentation on their accreditation capabilities.

4.3 Partnerships with other Organizations and Projects

As was the case for the OceanTeacher Academy Project (2009-2013) also the OceanTeacher Global Academy Project will work to seek collaboration and complementarity from/with other Organizations, Partners and projects.

Initial targets for such collaboration will include:
- POGO (AWI)
- EUMETSAT
- Universities (Erasmus Mundus: UGent and UAlg)
- EMODNET
Others can be added throughout the Project. Emphasis will be on collaborative agreements that will promote the sustainability of the RTCs and their network beyond the OceanTeacher Global Academy Project (2014-2017).