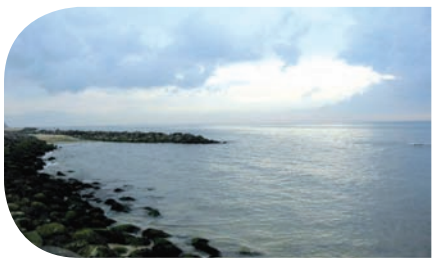
United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

TRANSFER OF MARINE TECHNOLOGY

Knowledge Sharing and Capacity Development for Sustainable Ocean and Coastal Management

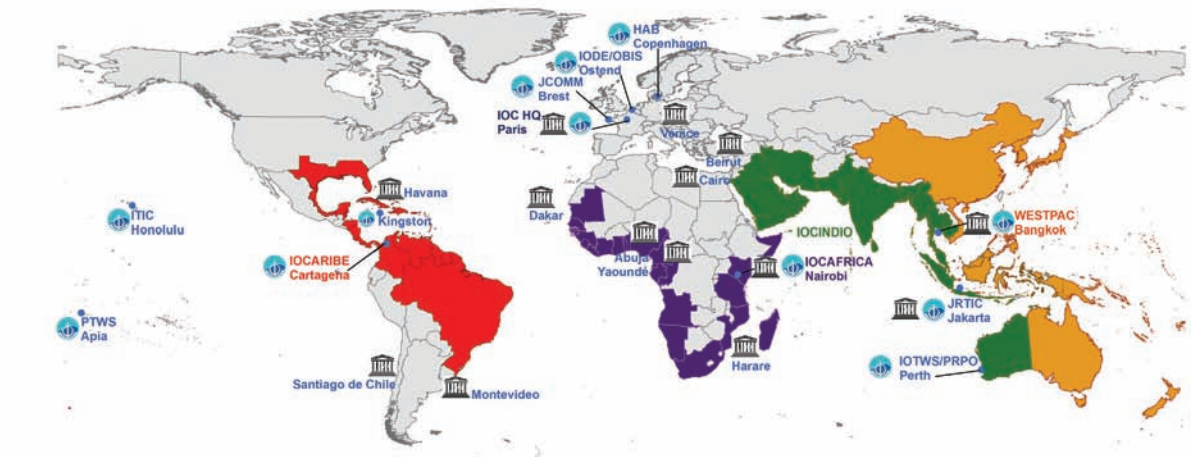
UNESCO-IOC. *Transfer of Marine Technology – Knowledge Sharing and Capacity Development for Sustainable Ocean and Coastal Management*. 2015; IOC Brochure 2014-3 (IOC/BRO/2014/3)

Intergovernmental Oceanographic Commission – the only United Nations body specialized in ocean science and services

The Intergovernmental Oceanographic Commission (IOC) of UNESCO is the only intergovernmental organization with a specific mandate in marine scientific research, services and capacity building in all of the world's ocean basins. Established in 1960 through UNESCO's 11th General Conference, the IOC is mandated "to promote international cooperation and to coordinate programmes in research, services and capacity-building, in order to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and the decision-making processes of its Member States" (IOC Statutes, Article 2.1). [1]

Based at the UNESCO Headquarters, in Paris (France), the IOC works through a wide array of field offices, which allows for a maximum of information exchange between the IOC Secretariat and its Member States on their needs and national priorities, particularly with respect to marine science and technology. IOC's three Regional Sub-Commissions – IOCAFRICA, for African and the Adjacent Island States (Nairobi, Kenya); IOCARIBE, for the Caribbean and Adjacent Regions (Cartagena de Indias, Colombia); and WESTPAC, for the Western Pacific and Adjacent Regions (Bangkok, Thailand), – liaise with national authorities to identify and act upon national needs, from the implementation of regional marine scientific research programmes to ocean literacy programmes, and workshops on data and information management. Beyond the Sub-Commissions, IOC's Regional Committees, Project/Programme Offices, and regional training centres complement and reinforce the Commission's field presence.

1. http://unesdoc.unesco.org/images/0012/001243/124367m.pdf



The Case for facilitating the Transfer of Marine Technology amongst nations

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) established a comprehensive legal framework for the oceans and seas, including providing a legal framework for the conservation and sustainable use of oceans and their resources, and is often referred to as "the constitution of the oceans". UNCLOS contains a number of provisions dealing with Marine Scientific Research (MSR) and Transfer of Marine Technology (TMT). In particular, it calls for all States to cooperate in accordance with their capabilities to promote actively the development and transfer of marine science and marine technology on fair and reasonable terms and conditions in order to help developing countries to access the benefits of oceans and seas.

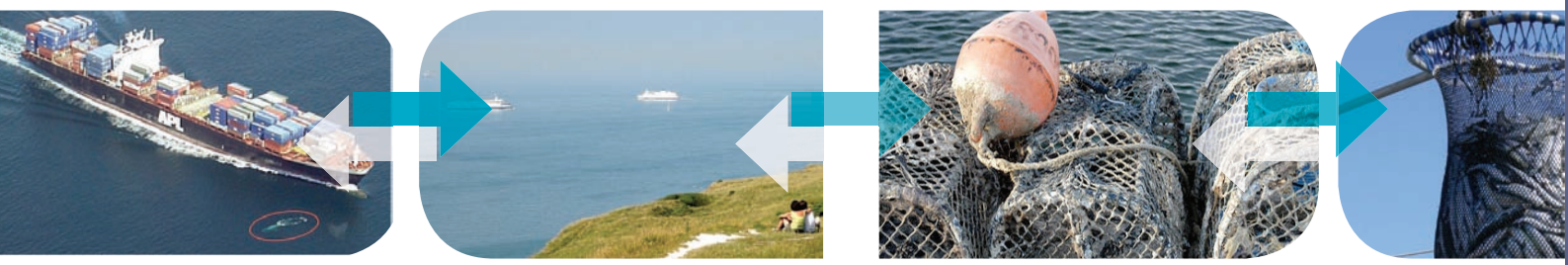
Technology and innovation are needed to take advantage of benefits that can be derived from ocean and sea related activities in a sustainable manner. TMT plays a key role in the development of countries, in particular developing countries, including through:

- Exploitation and exploration of marine resources;
- Navigation safety;
- Preservation of the marine environment; and
- Prevention of ocean-related hazards.

The need to facilitate TMT for nations to achieve sustainable use of the oceans and seas and their resources, is also recognized by a number of international agreements related to sustainable development [see box 1].

Small Island Developing States (SIDS) and Least Developed Countries (LDCs) are particularly concerned. The Expert Group Meeting on the Significance of Marine Science and Technology for SIDS and the Importance of Transfer of Marine Technology to SIDS to Support Sustainable Development (New York, May 14–17, 2013) recognized the importance of TMT

in relation to the development of marine scientific and technological capacity of SIDS countries to conserve and manage their marine resources in a sustainable manner, taking into account the benefits that SIDS derive from their marine environment as well as the fact that SIDS manage large ocean spaces of global significance, as indicated in the outcome document of the 2014 Third International Conference on SIDS in Apia, Samoa. The facilitation of transfer of marine technology and the promotion of related capacity development will help SIDS strengthen the management of their marine environment and contribute to sustainable development. [see box 2]



BOX 1 - The importance of facilitating the transfer of marine technology in relation to promoting marine scientific research is reaffirmed by international agreements, including the Rio+20 outcome document: *The future we want*, and the outcome document of the third International Conference on Small Island Developing States as well as discussions on the Sustainable Development Goals.

The Rio+20 Outcome document *The future we want* in its paragraph 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 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.

Outcome document A/CONF.223/3 of the third International Conference on Small Island Developing States in its paragraph 58 (f)

To undertake marine scientific research and develop the associated technological capacity of small island developing States, including through the establishment of dedicated regional oceanographic centres and the provision of technical assistance, for the delimitation of their maritime areas and the preparation of submissions to the Commission on the Limits of the Continental Shelf.

Open Working Group proposal for Sustainable Development Goals

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries

United Nations General Assembly resolution on Oceans and the Law of the Sea

The importance of facilitating the transfer of marine technology is indicated through the United Nations General Assembly (UNGA) resolutions on Oceans and the Law of the Sea, including :

- UNGA Resolution adopted on 29 December 2014 (A/RES/69/245) in paragraphs 10, 17, and 27
- UNGA Resolution adopted on 9 December 2013 (A/RES/68/70) in paragraphs 10, 17, and 27
- UNGA Resolution adopted on 11 December 2012 (A/RES/67/78) in paragraphs 10, and 26
- UNGA Resolution adopted on 24 December 2011 (A/RES/66/231) in paragraph 25
- UNGA Resolution adopted on 7 December 2010 (A/RES/65/37) in paragraph 25

BOX 2 - Examples of potential benefits of SIDS from relevant marine technologies in relation to water quality monitoring for ecosystem health [2]

Physical ocean parameters measured	*Examples of monitoring technology*	*Examples of areas where data can improve knowledge*	*How monitoring contributes to sustainable development*
Temperature; salinity; plankton; coral reef damage (bleaching); acidification	Argo; gliders; CTDs; XBTs; continuous plankton recorders; Individual monitoring buoys; satellites	Areas of visible and predicted bleaching (related to warm water temperatures) Presence of pollution sources Oxygen and eutrophication levels	Monitoring water quality in coastal areas (e.g. coral reef ecosystems) can drive action to help protect biodiversity, food sources and tourism. Warm coastal water can lead to coral bleaching. Pollution, acidification and changes in water chemistry can damage coral reefs and their economic potential. Water quality monitoring helps local authorities identify problems, promote conservation and protection measures, and put in place regulations to control sources of pollution in the longer term.

2. Sarah Grimes, "Ocean science for development in SIDS: Facts and figures", SciDev.Net, 28 August 2014
The information contained in the table is extracted from the article. For more information, please see the relevant webpage at http://www.scidev.net/global/water/feature/ocean-science-development-sids-facts-figures.html#

The IOC contributes to Marine Scientific Research and Transfer of Marine Technology in the framework of UNCLOS

With its unique mandate in ocean science and services, the IOC of UNESCO is recognized within the United Nations for its competencies in the field of Marine Scientific Research and Transfer of Marine Technology (Parts XIII and XIV of the United Nations Convention on the Law of the Sea). The IOC promotes international cooperation and coordinates programmes and projects in marine research, services, observation systems, hazard mitigation, and capacity development. In doing so, the IOC assists its Member States, particularly developing States, in developing their marine scientific and technological capacity with regard to the protection and preservation of the marine environment, marine scientific research and other relevant activities in the marine environment within the IOC field of competence[3]. The TMT can be implemented through IOC's targeted capacity development activities within its global and regional programmes and actions, as well as in cooperation with its partners within and outside of the UN system. In this connection, the Commission develops a new Capacity Development Strategy which highlights IOC contributions to transfer of marine technology and identifies venues for further cooperation.

United Nations General Assembly resolutions 56/12 (Par. 25), 57/141 (par. 25), and 59/24 (Par. 11), to name a few, have consistently called for IOC to take a leading role in TMT through the development, dissemination, and implementation of criteria and guidelines for appropriate interactions among relevant UN bodies, Member States, and relevant regional environmental, scientific, and fisheries organizations in the field of marine science and technology. Through these resolutions, the IOC should be seen as the main driver of the implementation and effective use of Part XIV of UNCLOS by Member States.

During its first session in 2001[4], the IOC's Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), an IOC subsidiary body whose function is to provide advice on the IOC's role in relation to UNCLOS upon the request from the IOC governing bodies, accepted the challenge of drawing criteria and guidelines on transfer of marine technology, following the instructions set forth in Article 271 of UNCLOS:

> *"States, directly or through competent international organizations, shall promote the establishment of generally accepted guidelines, criteria and standards for the transfer of marine technology on a bilateral basis or within the framework of international organizations and other fora, taking into account, in particular, the interests and needs of developing States"*

The *IOC Criteria and Guidelines on the Transfer of Marine Technology* (CGTMT) were endorsed by the IOC Assembly in 2003, and were published in 2005[5] for the purpose of dissemination and promotion of its implementation among Member States and relevant international organizations. Through the CGTMT, the IOC hopes to inspire national actions, legislation, projects, and programmes, as the concept of Transfer of Marine Technology represents a true opportunity in international cooperation under the IOC umbrella. The facilitation of TMT supported by a set of criteria and guidelines is also meant to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs.

In the CGTMT, marine technology refers to instruments, equipment, vessels, processes and methodologies required to produce and use knowledge to improve the study and understanding of the nature and resources of the ocean and coastal areas. Toward this end, marine technology may include any of the following components:

a) Information and data, in a user-friendly format, on marine sciences and related marine operations and services
b) Manuals, guidelines, criteria, standards, reference materials
c) Sampling and methodology equipment (e.g., for water, geological, biological, chemical samples)
d) Observation facilities and equipment (e.g. remote sensing equipment, buoys, tide gauges, shipboard and other means of ocean observation)
e) Equipment for *in situ* and laboratory observations, analysis and experimentation
f) Computer and computer software, including models and modelling techniques
g) Expertise, knowledge, skills, technical/scientific/legal know-how and analytical methods related to marine scientific research and observation.

TMT should enable all parties concerned to benefit on an equitable basis from developments in marine science related activities, in particular, those aiming at stimulating the social and economic contexts in developing

States. The CGTMT points out, as one of the criteria, that TMT should take full advantage of new, existing or expected co-operation schemes, including joint ventures and partnerships, among Member States, appropriate international organizations, governmental and non-governmental organizations and/or private entities. In this regard, the IOC, as a competent international organization recognized for the promotion of international co-operation and the co-ordination of programmes in the field of ocean and coastal scientific research, related services and capacity-building, bears a special responsibility.

This brochure compiles a comprehensive list of recent and ongoing IOC activities in support of the transfer of marine technology as defined in the CGTMT, throughout its programmematic spectrum. In the interest of brevity, the profiles for each activity display only the most necessary information, in addition to a short general description. Links to the specific programme/project/activity websites were included to guide readers toward more detailed information. Where possible, the profiles try to indicate for each project which component(s) of the IOC definition of marine technology are included in the TMT activities.

3. It is also consistent with UNESCO Strategic Objectives 4 and 5 to which IOC contribute. Please refer to UNESCO: http://unesdoc.unesco.org/images/0022/002278/227860e.pdf
4. http://unesdoc.unesco.org/images/0012/001226/122697eo.pdf
5. Intergovernmental Oceanographic Commission. IOC Criteria and Guidelines on the Transfer of Marine Technology (CGTMT). Paris, UNESCO, 2005. 68 pp. English/French. IOC Information document: IOC/INF-1203. (http://unesdoc.unesco.org/images/0013/001391/139193m.pdf)

IOC FLAGSHIP INITIATIVES RELATED TO TRANSFER OF MARINE TECHNOLOGY

4

OceanTeacher (OceanTeacher Global Academy)

Programme: OceanTeacher (OceanTeacher Global Academy)
Website: http://www.oceanteacher.org
Type of marine technology: processes and methodologies; b, f, g
Recipients: Experts and students
Duration: Continuous
Scope: Global
Funding: 2009-2013: Government of Flanders (Kingdom of Belgium) (USD 1,540,000); UNESCO/IOC (USD 153,000);
2014-2017: Government of Flanders (Kingdom of Belgium) (USD 2,600,000)

OceanTeacher (OT) has been developed as a training system for ocean data managers (working in ocean data centres), marine information managers (marine librarians) as well as for marine researchers who wish to acquire knowledge on data and/or information for planning and management. Since 2005, more than a thousand students from over a hundred countries attended courses at the IOC Project Office for IODE, based in Ostend, Belgium, and elsewhere in the context of regional projects. The "Global Academy" component of OT (OTGA)[6] will expand the programme into a worldwide training facility, which will organise training courses related to multiple IOC fields (from Integrated Costal Management to Tsunami Warning Systems) through a network of several Regional Training Centres (RTCs) spread across the globe (see introductory videos on https://vimeo.com/album/2855369) , all of them working in close collaboration using advanced information technology and sharing training resources via the OceanTeacher Learning Management System. English, Spanish, French and other national languages will be used depending on the regional and national context. Most interestingly, OTGA will change training from a "north to south" culture to a north-south, south-south, and south-north model by promoting the expertise already available in developing countries. OTGA will also facilitate the use of expertise across regions through distance lecturing (video conferencing technology) and recording lectures and making them available over the Web.

Group of students attending an OTA training course at the IODE Project Office, Ostend, Belgium
© Claudia Delgado, IODE

6.This new "OceanTeacher Global Academy" concept is implemented from 2015 onwards.

OBIS: A unique support mechanism for the UN Biodiversity Beyond areas of National Jurisdiction (BBNJ) Governance

Programme: IODE's Ocean Biogeographic Information System (OBIS)
Website: http://www.iobis.org/
Type of marine technology: information, data, processes and methodologies; a, b, f, g
Recipients: Experts
Duration: Continuous
Scope: Global
Funding: 2000-2010: USD 5 million (A.P. Sloan Foundation & associated funds); 2010 onwards: (UNESCO, Member States and European Commission and in-kind contributions)

With over 40 million observations of 115,000 marine species from 1,600 datasets provided by nearly 500 institutions in 56 countries, the OBIS information system is currently the largest single data repository for biological data for the world's oceans. OBIS was established by the Census of Marine Life, and since 2009 continues to grow under the auspices of the Intergovernmental Oceanographic Commission of UNESCO's International Oceanographic Data and Information Exchange (IODE) programme. OBIS operates through a network of national and thematic nodes, and a secretariat based at the IOC Project Office for IODE in Ostend, Belgium. The secretariat builds and maintains the central database and online data portal, and provides training[7] and technical assistance, guides new data standards and technical developments, and encourages international cooperation to foster the group benefits of the global network.

OBIS plays a vital role in building the scientific knowledge base to support ocean governance and management, and provides baseline information for global assessments on the state of the marine environment, area-based management tools, such as the identification of Biologically Significant Marine Areas (UNEP-CBD, 2013) and environmental impact studies. OBIS can play an important role in activities in Areas Beyond National Jurisdiction (ABNJ). Technical experts at the UN BBNJ workshop in May 2013 (UN, 2013) identified OBIS as an appropriate mechanism for data sharing, hereby contributing to capacity building, benefit sharing and transfer of marine technology. OBIS is also quite unique because it holds data from all marine species including non-commercial, non-target fishing species, which allows a holistic (ecosystem) approach to measure impacts of activities in ABNJ. Recently the Deep-Ocean Stewardship Initiative (DOSI) called for an international field programme and coordinated data repository to be developed in conjunction with e.g. the International Seabed Authority and IOC-UNESCO's OBIS. In a recent *Science* paper, Mengerink et al. (2014) called for a funding mechanism as part of a benefit-sharing regime in ABNJ to support scientific research and information generation including support for a global deep-ocean data repository, which could be part of OBIS.

Eusynstyela latericius © WoRMS Photo Gallery / Shenkar, Noa, 2012

References

UNEP-CBD (2013). *Progress report on marine and coastal biodiversity: Use of scientific and technical information for describing ecologically or biologically significant marine areas (EBSAs).* UNEP/CBD/SBSTTA/17/INF/3

UN (2013). *Summary report of the Intersessional Workshops aimed at improving understanding of the issues and clarifying key questions as an input to the work of the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction* (A/AC.276/6).

Mengerink et al. (2014). A Call for Deep-Ocean Stewardship. *Science* 334: 696-698. DOI: 10.1126/science.1251458

7. OBIS nodes technical training promo video: http://vimeo.com/94670006

LIST OF IOC PROGRAMMES, PROJECTS & ACTIVITIES RELATED TO TRANSFER OF MARINE TECHNOLOGY

5

The IOC implements a variety of programmes and projects contributing to the transfer of marine technology through the areas identified by the IOC Medium-Term Strategy 2014–2021: (i) Ocean research; (ii) Observing system / data management; (iii) Early warning and services; (iv) Assessment information for policy; (v) Sustainable management and governance; and (vi) Capacity development

Ocean Research

IOC Harmful Algal Blooms Programme (IOC-HAB)

Type of Marine Technology: process, methodologies; b, e, g
Recipients: Experts (over 900 experts from 29 different countries) and Ph.D. students
Duration: Annual courses and 1-3-month trainings
Scope: Global and regional
Funding: Denmark, Spain, USA as well as many national partner institutions for each specific training activity.

Description of TMT Activity: The HAB capacity development component includes 1-2 annual courses on observation and identification of harmful algae, shorter training stays for scientists, and cooperative research projects for training though research. The IOC Science and Communication Centre on Harmful Algae, the coordinating structure for these activities, has organized over 20 years more than 65 training courses in species identification, toxicity testing, and monitoring and management strategies. Emphasis has been given to regions most unprepared to meet HAB impacts, such as South East Asia and Latin America, but the need for upgraded skills has been global and systematic.

Website: http://hab.ioc-unesco.org/

Training-through-Research Programme (TTR)/At-Sea Training

Type of Marine Technology: processes and methodologies; g
Recipients: Young researchers in marine geosciences (undergraduate, postgraduate and Ph.D. students etc.)
Duration: Annual cruises (2-3 or 6-8 weeks-long) and post-cruise conferences and workshops
Scope: Global, with specific regional components
Funding: Member States, universities, national institutes and foundations

Description of TMT Activity: The project seeks to provide ship-board training and research opportunities to students and young scientists, allowing them to use data collected during the cruises for writing B.Sc., M.Sc., and Ph.D. theses. Over 750 students and young researchers from over 30 countries of Asia, Africa, Europe, Latin America and Middle East have been trained. Region-specific activities have been developed through the Caspian Floating University, the Baltic Floating University, and the University of the Sea programmes. Together, these projects have been used by over 1000 students from more than 25 countries, through the research cruises as well as post-cruise seminars, workshops, and conferences.

Ocean Research IOC Grants

Type of Marine Technology: processes and methodologies; a, b, f, g
Recipients: Students and/or professionals
Duration: Continuous
Scope: Global
Funding: At this point in time funds have not been secured for 2014 travel or research grants.

Description of TMT Activity: The project offers yearly conference travel and study grants to marine sciences students and/or professionals from developing countries to facilitate their participation in scientific/technical ocean-oriented conferences, workshops or meetings, with priority given to subjects directly relevant to IOC programmes and strategy. Funds for attendance at conferences are conditional on the applicant being accepted to present a paper or poster on original research work. Workshops/meeting attendees are required to provide details of the expected benefits to their ongoing research activities.

IOC-UNESCO Chairs

Type of Marine Technology: processes and methodologies; b, f, g
Recipients: Students (Undergraduate and Graduate), young researchers, academics and professionals/experts.
Duration: Varies by project, first IOC-UNESCO Chair established in 1993.
Scope: Global, with specific regional components
Funding: UNESCO regular budget

Description of TMT Activity: The IOC-UNESCO Chairs apply innovative approaches that include among others the training-through-research scheme combining formal education with field research and on-the-job training. Students involved in field projects participate in the processing and analysis of data as visiting scholars to participating universities and institutions, and write up results as professional contributions to the advancement of marine science. The academic focus and structure of the UNESCO Chair programmes vary, depending on the host institution, but the overall programme is based on a desire to advance research, training and programme development in all of UNESCO's fields of competence by building university networks and encouraging inter-university cooperation through the transfer of knowledge across borders. IOC has established UNESCO Chairs in Marine Technology (University of Dar es Salaam, Tanzania), Remote Sensing and Modelling in Oceanography (RSHU, Russia), Marine Geology and Geophysics (Moscow State University, Russia), Marine Sciences and Oceanography (Eduardo Mondlane University, Mozambique), Oceanography and Coastal Management (University of Concepción, Chile), and Marine Geology and Coastal Management (Christian Albrechts University of Kiel, Germany).

IOC Regional Network of Training and Research Centres on Marine Science

Type of Marine Technology: processes and methodologies; f, g
Recipients: Students (Undergraduate and Graduate), young researchers, academics and professionals/experts.
Duration: Since 2010, Varies by regional training and research centres, but the first IOC Regional Training and Research Centre was established in 2010 with focus on Ocean Dynamics and Climate, hosted by the First Institute of Oceanography, State Oceanic Administration of China.
Scope: Regional (Western Pacific and Adjacent Regions)
Funding: USD 200,000 from China for the first IOC Training Research Centre and in-kind contributions from other host countries.

Description of TMT Activity: "UNESCO/IOC Regional Network of Training and Research Centres on Marine Science", initiated by the IOC Sub-Commission for the Western Pacific (WESTPAC), aims to improve regional capability and capacity on marine science in a sustainable and systematic manner, through the establishment of IOC Regional Training and Research Centres (RTCs) in national oceanographic institutes or universities, and regular provision in these Centres of training and research opportunities on their domains of focus to young scientists mainly from developing countries within and outside the region. Those RTCs and their focus vary from one to another, established based on regional priority interests and the specialization of host institutions. The overall goal of this programme is to advance marine science capacity in the Asia and Pacific through the transfer of technology. IOC has established the first Regional Training and Research Centres on Ocean Dynamics and Climate (First Institute of Oceanography, State Oceanic Administration of China, Qingdao, China), with regular trainings provided annually on ocean and climate models. Other RTCs are under development.

Website: http://iocwestpac.org/capacity-development/49.html

Promoting the Awareness on Coastal Marine Environmental Changes and its Impact (PACMEC)

Type of Marine Technology: processes and methodologies; a, b, c, e, g
Recipients: early career scientists, researchers, experts, government agencies.
Duration: continuous since 2010
Scope: Regional (Western Pacific and Adjacent Regions)
Funding: USD 452,000 in cash from Japan with in-kind contributions from Thailand, Vietnam, Indonesia, Malaysia and others in the region

Description of TMT Activity: The objectives of this programme are to establish/strengthen the regional research network and promote data and information exchange on harmful algal blooms and associated eutrophication, natural biotoxins in marine organisms, marine invasive species, remote sensing for coastal habitats and other emerging marine biodiversity issues, such as coral reef restoration during the implementation of this project; and enhance the awareness of the general public on the impacts of nutrient loads from anthropogenic activities, the risk of natural biotoxins in marine organisms to human health, the negative social and ecosystem impacts of marine invasive species, and loss of coastal habitats and other emerging marine biodiversity issues, such as coral reef restoration. The programme has been carried out through a number of regional scientific workshops, trainings, field surveys and publications.

Enhance the Capacity for Species Identification and Genetic Analysis on Marine Organisms in the Coral Reef Ecosystems in the Western Pacific (DRMREEF)

Type of Marine Technology: processes and methodologies; a, b, c, e, g
Recipients: Researchers, experts, government agencies
Duration: March 2013- February 2015
Scope: Regional (Western Pacific and Adjacent Regions)
Funding: USD 140,000 in cash from Republic of Korea with in-kind contributions from Thailand, Malaysia, Vietnam, and other countries

Description of TMT Activity: The programme aims to enhance national and regional capacity for species identification and genetic analysis on marine organisms in the coral reef ecosystems through scientific workshops, trainings, lab analysis. This programme has been implemented in partnership with marine scientific institutes and universities in the region that are working on the taxonomy of marine organisms in the coral reef ecosystem and interested to develop their capacity for DNA taxonomy in the identification of marine organisms in reef ecosystems.

Website: http://iocwestpac.org/dna-taxonomy-of-coral-marine-organisms/167.html

ANCA – HAB Harmful Algal Blooms Programme (IOCARIBE-ANCA Harmful Algae in the Caribbean and Adjacent Regions)

Type of Marine Technology: process, methodologies, guidelines; b, e, g
Recipients: Experts, students, policy makers, health authorities
Duration: Continuous since 2005
Scope: Regional (Caribbean and adjacent regions)
Funding: Colombia, Mexico, Spain, USA as well as many national partner institutions for each specific training activity.

Description of TMT Activity: The ANCA capacity development component includes 1-2 annual courses on observation and identification of harmful algae, shorter training stays for scientists, and cooperative research projects for training though research. These courses are carried out by IOCARIBE region institutions jointly with the IOC Centre on Harmful Algae.

Website: http://iocaribe.ioc-unesco.org/

International Oceanographic Data and Information Exchange (IODE)

(1) OceanDataPortal / International Coastal Atlas Network/ OceanDocs / OceanExpert
Type of Marine Technology: information and data; a, b, f, g
Recipients: Experts, decision makers, general public
Duration: Continuous
Scope: Global
Funding: UNESCO and Member States

Description of TMT Activity: Through its member data centres and marine libraries, IODE has developed a number of portals and related products to assist scientists, decision makers and the general public. These include data portals, e-repositories (publications), an expert directory as well as coastal atlases. These services are coordinated, and some of them hosted, by the IOC Project Office for IODE, Ostend, Belgium.

Websites: http://www.iode.org
http://www.oceandataportal.org (OceanDataPortal): portal, providing through a distributed network, access to millions of ocean observations
http://www.iode.org/ican (International Coastal Atlas Network): network of experts in coastal atlas development
http://www.oceandocs.net/ (OceanDocs): international e-repository of scientific literature
http://www.oceanexpert.net/about.php (OceanExpert): global directory of marine and freshwater professionals

(2) Ocean Data Standards / IODE Ocean Data Practices
Type of Marine Technology: manuals and guidelines; b
Recipients: Experts
Duration: Continuous
Scope: Global
Funding: UNESCO and Member States

Description of TMT Activity: One of the main objectives of IODE is to coordinate and agree upon standard methods for data management (e.g. quality control). Jointly with WMO, under the Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM), IODE manages the Ocean Data Standards project, which aims at defining standards in data management, and the "clearing house" service (OceanDataPractices), which seeks to document all practices used for data and information management in one single online repository.

Websites: http://www.oceandatastandards.org/ (Ocean Data Standards)
http://www.oceandatapractices.org (IODE Ocean Data Practices)

(3) IODE Ocean Data and Information Network (ODIN)
Type of Marine Technology: Instruments, equipment, processes and methodologies; b, f, g
Recipients: Experts
Duration: Project phases normally last 4 years
Scope: Regional
Funding: Financial support from the Government of Flanders (Belgium), and funding from other Member States

Description of TMT Activity: The ODIN (Ocean Data and Information Network) strategy is based upon four elements: (i) providing computer equipment, (ii) providing training, (iii) providing seed funding for operational activities of newly created data centres and marine libraries, and (iv) work in a regional context, addressing common (regional) as well as individual (national) goals for data management and sharing. The ODIN strategy focuses on a two-tiered approach in terms of product and service development: ODIN projects deliver regional products and services (e.g. regional databases) but each partner country also received support to develop products and services that are specific to national or even local priorities and needs.

Websites: http://www.iode.org/odin
http://odinecet.iode.org/ (ODINECET: European Countries in Economic Transition)
http://www.odinafrica.org/ (ODINAFRICA)
http://www.odinwestpac.org/ (ODINWESTPAC (Western Pacific Region))
http://www.iode.org/odinpimris (ODIN-PIMRIS (Pacific Island States))
http://www.odinblacksea.org/ (ODINBLACKSEA (Black Sea Region))

(4) Ocean Biogeographic Information System (OBIS). Flagship initiative presented in section 4.

Global Sea Level Observing System (GLOSS)

Type of Marine Technology: processes and methodologies; b, f, g
Recipients: Experts
Duration: Continuous since 1983
Scope: Global
Funding: USA, UK, France, space agencies and many national institutions that have provided in kind support.

Description of TMT Activity: Training courses and workshops on sea level measurement and interpretation have been held at least annually since 1983 covering tide gauge installation, maintenance and operation; data reduction of sea level observations; geodetic fixing of tide gauge benchmarks; uses of sea level data in scientific analysis and practical coastal applications; and data exchange. Since the 1990s, training has focused on computer-based data analysis, through Hands-on Training Sessions (HOTS), and on the application of observing techniques to studies of regional and local processes. Training courses/workshops locations include: UK (annually 1983-1990), China (1984), France (1990), Brazil (1993), India (1995), Argentina (1996), UK (1997), South Africa (1998), Brazil (1999), Saudi Arabia (2000), Chile (2003), Malaysia (2004), Japan (2006), Belgium (2006), Puerto Rico (2008), Grenada (2011) and Mexico (2012).

Website: http://www.gloss-sealevel.org/training

Data Buoy and Cooperation Panel (DBCP)

Type of Marine Technology: Processes and methodologies; b, f, g
Recipients: Experts
Duration: Continuous
Scope: Global and regional

Description of TMT Activity: The primary objective of the DBCP is to maintain and coordinate all components of the network of over 1250 drifting buoys and 400 moored buoys, which provide measurements such as sea-surface temperature, surface current velocity, air temperature and wind speed and direction. The Panel's TMT activities include the production of technical publications useful to Member Countries wishing to develop national activities, the organization of scientific and technical workshops, and the hosting of training courses. DBCP data users and technology workshops have been organized in the UK and at the IODE Project Office, in Ostend (Belgium), aimed at the African and Western Indian Ocean/North Pacific regions.

Website: http://www.jcommops.org/dbcp/

African Summer School on Application of Ocean and Coastal Ocean Data and Modelling products

Type of Marine Technology: processes and methodologies; b, f, g
Recipients: Students, young researchers, academics and professionals/experts, with a minimum of M. Sc. in marine related fields
Duration: April – September 2014, with possibility of having courses in subsequent years
Scope: Regional (Africa)
Funding: Flanders UNESCO fund (Belgium), with extra support from the University of Cape Town (South Africa), World Meteorological Organization, University of Ghana, and the Kenya Meteorological Services.

Description of TMT Activity: The goal of the African Summer School on Application of Ocean and Coastal Data and Modelling Products is to build African capacity to access and utilize ocean and coastal data (and relevant meteorological data) from in-situ and satellite observations, as well as those generated from ocean models to produce useful services for local use, for a wide variety of human and economic benefit purposes. On the basis of case studies, the participants will learn how to optimize the use of widely available data and analysis tools. 18 participants from 10 African countries participated in the first summer school and worked on case study proposals covering ocean-atmosphere dynamics, wave/coastal dynamics, tides and storm surges, ocean circulation, marine forecasting, and use of remote sensing for identification of potential fishing zones.
Trainers and resource persons were provided by the Australian Ocean Data Centre, University of Cape Town-South Africa, University of Ghana, National Institute of Oceanography-India, Indian National Centre for Ocean Information Services, Kenya Meteorological Services, Institut Halieutique et des Sciences Marines-Université de Toliara (Madagascar), Nigerian Institute of Oceanography and Marine Science, and the Tanzanian Fisheries Research Institute.

Ocean Forecasting Demonstration System for the South East Asian Seas

Type of Marine Technology: processes and methodologies; a, b, f, g
Recipients: Researchers, experts, government agencies.
Duration: Continuous since 2010
Scope: Regional (Western Pacific and Adjacent Regions)
Funding: Voluntary contribution by participating countries.

Description of TMT Activity: "Ocean Forecasting Demonstration System for the South East Asian Seas" was initiated as one pilot project of the "South East Asian – Global Ocean Observing System" (SEAGOOS) by the IOC Sub-Commission for the Western Pacific (WESTPAC) in 2010. The programme developed an ocean forecasting demonstration system for identified areas of Peninsular Malaysia's eastern shelf and Gulf of Thailand, The OFDS provides 3 days forecast products and downloadable archived data of surface wave height, wave period, sea level, three dimension current, sea temperature and salinity. The crucial information could serve the needs of a variety of human activities related to the prevention and reduction of the impacts of marine hazards, fishery management, protection of marine environment and conservation of marine ecosystems. So far the wave-tide-circulation coupled model of 13 km resolution for the southern region of the South China Sea has been developed and experimental forecasts are broadcasted at the website: http://221.0.186.5/IOC-WESTPAC_OFDS/. Development of high-resolution models (1-3 km) of the Peninsular Malaysia eastern's shelf and Gulf of Thailand is currently ongoing.

Websites: http://iocwestpac.org/ocean-forecasting-system-ofs/193.html
http://221.0.186.5/IOC-WESTPAC_OFDS/.

Monsoon Onset Monitoring and its Social & Ecosystem Impacts (MOMSEI)

Type of Marine Technology: processes and methodologies; a, d, e, g
Recipients: Researchers, experts, government agencies
Duration: Continuous since 2010
Scope: Regional (Western Pacific and Adjacent Regions)
Funding: Voluntary contribution by participating countries

Description of TMT Activity: The overall objective of MOMSEI aims to improve, from air-sea interaction's point of view, the understanding and forecasting of Asia monsoon and its multi-scale variability at a regional scale through developing and carrying out air-sea observations over the Andaman Sea and the Bay of Bengal, and analyzing the preconditioning role of ocean in the monsoon onset. In addition to regular workshops, joint cruises, MOMSEI Summer School is also organized annually to develop regional and national science and observation capacity for monsoon science, air-sea interactions.

Website: http://iocwestpac.org/monsoon-onset-monitoring-and-its-social-and-ecosys/188.html

Early Warning and Services

Tsunami

Type of Marine Technology: instruments, equipment, processes and methodologies; a, b, d, f, g
Recipients: National and regional authorities/experts
Duration: Continuous
Scope: Global
Funding: UNISDR, UN-ESCAP, UNDP, Norway, Finland, Australia, Italy, Germany, Ireland, European Union, Japan, Canada, USA, Oman as well as in-kind contributions from many national institutions that have hosted workshops and meetings

Description of TMT Activity: The IOC Secretariat and Intergovernmental Coordinating Groups of regional tsunami and other coastal hazards warning systems coordinate regional workshops on Standard Operating Procedures (SOPs) for tsunami warning and emergency response, operational procedure, Tsunami emergency preparedness, data analysis, tsunami modelling, installation of tsunami monitoring/warning facilities. Participants include: (i) members of the country's national tsunami warning centre/tsunami warning focal point, national disaster management office, or geohazards agency; and (ii) individuals responsible for and involved in tsunami warning and emergency response operations, and/or those responsible for their country's Standard Operating Procedures (SOPs).

Website: http://www.ioc-tsunami.org/

Improving Emergency Response to Ocean-based Extreme Events through Coastal Mapping Capacity Building in the Indian Ocean Project (COAST-MAP-IO)

Type of Marine Technology: processes and methodologies; a, b, f, g
Recipients: Regional experts
Duration: 3 years (2007-2010)
Scope: Regional (Indian Ocean)
Funding: Italy, and in-kind contributions from India, France, Norway, Sweden, and several national and regional institutes.

Description of TMT Activity: The project sought to enhance available expertise to locally produce accurate bathymetric and topographic maps; provide modelling capacity for inputs to tsunami arrival, run-up and inundation in coastal areas; transfer necessary skills to national Disaster Management and Preparedness agencies; and more generally to use advanced datasets to develop targeted maps and services, including f ooding maps, coastal ecosystem mapping, and coastal zoning.

Assessment Information for Policy

In the context of the UN World Ocean Assessment (WOA)

Type of Marine Technology: processes and methodologies; a, g
Recipients: Experts and students
Duration: Continuous
Scope: Global and regional
Funding: UNESCO Regular Programme and extra budgetary resources

Description of TMT Activity: IOC is providing scientific and technical support to the UN World Ocean Assessment. As recognized by the UN General Assembly, capacity building is essential for the implementation, and is an integral part of, the World Ocean Assessment (WOA). To this end, the WOA will contribute to the promotion and facilitation of capacity-building through international cooperation, including technical cooperation and transfer of technology towards developing countries, in particular least developed countries, African coastal States and Small Island Developing States. Together with other partners such as UNEP, IOC has organized several regional training workshops focusing on marine assessment methodologies with specific objectives on the development of: (i) standardised information content for assessments at various scales and common approaches towards assessment methodologies; (ii) approaches for scaling up assessments (national, subregional, regional, global – that is, establishing how far assessments at one level can be used at other levels); and (iii) reporting forms to assist the integration process, with the aim of securing coherence, consistency and comparability as far as possible.

Marine Spatial Planning

Type of Marine Technology: processes and methodologies, modelling; b, f, g
Recipients: National and regional authorities in charge of coastal and marine management and planning.
Duration: One week course for training
Scope: Global, with specific regional components
Funding: UNESCO regular budget

Description of TMT Activity: The IOC-UNESCO aims to increase collective capacity to respond to change and challenges in coastal and marine environments through further development of science based management tools such as integrated coastal area management, marine spatial planning and large marine ecosystem approach. A different sort of guidelines and tools have been developed by dedicated group of experts focusing on both processes and outcomes, considering governance, socio-economics and ecological dimensions for building management and technical capacities. The Marine Spatial Planning guidelines are primarily intended for professionals responsible for the planning and management of coastal and marine areas, considering all potential limitations in terms of financial support, information and other resources. The guidelines, available in English, Spanish, Vietnamese and Chinese, have already been used to develop innovative MSP that are currently under evaluation.

Website: http://www.unesco-ioc-marinesp.be/

Caribbean Marine Atlas (CMA)

Type of Marine Technology: processes and methodologies, a, b, f, g
Recipients: Regional experts, policy makers
Duration: Continuous since 2007
Scope: Regional (Caribbean and adjacent regions)
Funding Government of Flanders (Belgium) and participating countries

Description of TMT Activity: The Caribbean Marine Atlas (CMA) will be a digital atlas comprising easily downloadable data on various key themes relevant to the marine and coastal environment of the Caribbean. Among these themes are coastal habitats, fisheries, environmental quality, climate change and sea level rise, oceanography, as well as socio-economic aspects. Its purpose is to identify, collect and organize available geo-spatial datasets into an atlas of environmental themes for the Caribbean region as a support service to the sustainable development and integrated management of marine and coastal areas in the region. The CMA is an activity developed within the framework of the Ocean Data and Information Network for the Caribbean and South America region (ODINCARSA). As part of the Atlas development, the IODE programme provides the necessary training to the relevant experts from each country.

Website: http://www.caribbeanmarineatlas.net/

Sutainable Management and Governance

IOC-UNDP Adaptation to Climate Change in Coastal Zones Project (ACCC Project)

Type of Marine Technology: processes and methodologies, technical and scientific skills; b, g
Recipients: Experts in the region, local decision-makers
Duration: 2008-2012
Scope: Regional (West Africa)
Funding: GEF (USD 964,000)

Description of TMT Activity: The project focused on implementing guidelines for the implementation of coastal adaptation measures through an Integrated Coastal Area Management (ICAM) framework in Cabo Verde, Gambia, Guinea-Bissau, Mauritania and Senegal, with local, national, and regional components. From reforestation to rehabilitation of tourism to the creation of an entirely new ecotourism village, nature-based solutions for climate change adaptation were selected based on their ability to reinforce coastal community's socio-economic indicators (capacity building, employment, investment in infrastructure, etc.) as much as their efficacy as ecosystem-based tools. Technical capacity building was high on the ACCC project agenda, particularly in regards to ensuring local professionals could perform coastal vulnerability assessment and planning, and develop coastal observation tools in support of adaptation.

Link to brochure: http://unesdoc.unesco.org/images/0021/002179/217953e.pdf

Southeast Pacific Data and Information Network in Support of Integrated Coastal Area Management (SPINCAM)

Type of Marine Technology: indicator development, process, methodologies, expertise, technical/scientific skills; (models) a, b, g, f
Recipients: National technical experts in marine science institutions and coastal management authorities
Duration: 2008-2016
Scope: Regional (South East Pacific)
Funding: The Government of Flanders (Belgium); USD 1,930,000 (Flanders-UNESCO Trust Fund for Science); USD 2,788,000 from IOC/UNESCO and participating countries (in-kind and cash contributions)

Description of TMT Activity: IOC's most successful ICAM project to date, SPINCAM has been developed since 2009 in partnership with the Permanent Commission of the Southeast Pacific (CPPS) with the aim of establishing an ICAM indicator framework at the national and regional levels for the countries of the Southeast Pacific Region (Chile, Colombia, Ecuador, Panama, and Peru) and the development of decision support systems. The project strengthened capacities for indicator development, management of oceanographic data, the development of spatial (national and regional) data atlases through training courses with IOC's IODE.

Website: http://www.spincamnet.net/

Capacity Development

OceanTeacher (OceanTeacher Global Academy)

Flagship initiative presented in section 4.

Coastal Modelling and Decision Support Tools

Type of Marine Technology: processes and methodologies, modelling; b, f, g
Recipients: Regional experts
Duration: 2007-2011
Scope: Regional
Funding: European Union and the Swedish International Development Agency

Description of TMT Activity: The project provides coastal modelling tools and hydrodynamic training activities (modelling workshop and the EU-funded ReCoMap project) in the Western Indian Ocean region. Coastal modelling tools have provided science-based solutions to developing countries in regards to coastal zone management issues, allowing more effective communication of scientific results to decision-makers, and producing a better overall understanding of coastal processes. Coastal modelling and decision support tools also serve to empower non-state actors in developing countries, promoting a participatory approach to the development of coastal management plans.

IHO-IOC General Bathymetric Chart of the Oceans (GEBCO) Project

Type of Marine Technology: processes and methodologies, b, f, g
Recipients: Young experts
Duration: Twelve month course for training
Scope: Global and regional
Funding: The Nippon Foundation

Description of TMT Activity: As a joint project of the IOC and the International Hydrographic Organization (IHO), GEBCO produces bathymetric charts and digital grids of the world ocean f oor by collating, interpreting and contouring, with the aid of directional fabrics revealed by satellite gravity, single and multibeam acoustic soundings collected by surface ships, submarines and other underwater vehicles. GEBCO relies largely on the voluntary contributions of an international team of geoscientists and hydrographers who work on the development of a range of global bathymetric data sets and data products. The Master level course, leading to a Postgraduate Certificate in Ocean Bathymetry (PCOB), has been held at the University of New Hampshire, USA since 2004. In the course, students are taught theoretical and practical aspects of ocean mapping, work on a team project, spend time at other ocean mapping institutes and participate in a deep sea mapping cruise.

Website: http://www.gebco.net/

Caribbean Large Marine Ecosystem (CLME)

Type of Marine Technology: processes and methodologies; a, b, g
Recipients: Regional experts, policy makers
Duration: Continuous since 2009
Scope: Regional (Caribbean and adjacent regions)
Funding: Global Environment Facility (GEF)

Description of TMT Activity: The CLME Project assists participating countries from the Wider Caribbean Region to improve the management of their shared Living Marine Resources -most of which are considered to be fully or overexploited- through an Ecosystem-Based Management (EBM) approach. A preliminary Transboundary Diagnostic Analysis (TDA) identified three priority transboundary problems that affect the Caribbean Large Marine Ecosystem (CLME): unsustainable exploitation of fish and other living resources, habitat degradation and community modification, and pollution. The final TDAs prepared under the full-sized CLME Project serve as the science basis for the development of an agreed programme of interventions (called "SAP"), which may include policy, legal and institutional reforms, conservation measures and pollution control. The CLME Project will facilitate the strengthening of the governance of key fishery ecosystems in the wider Caribbean Region, at the regional, sub-regional and national levels.

Website: http://www.clmeproject.org/index.html

IOCARIBE ICAM (IOCARIBE Integrated Coastal Area Management)

Type of Marine Technology: indicator development, process, methodologies, expertise, technical/scientific skills; (models) a, b, g, f
Recipients: National, regional technical experts in marine science institutions and coastal management and planning authorities, policy makers
Duration: Continuous since 2006
Scope: Regional (Caribbean and adjacent regions)
Funding: IOC, Barbados, Colombia, Mexico, Spain, Sweden

Description of TMT Activity: The Integrated Coastal Area Management (ICAM) Project undertaken by IOCARIBE aims at supporting countries in the wider Caribbean to address coastal and area planning by providing the necessary tools and acting as a resource to assist in ICAM. Specifically, it aims to build the resilience of Caribbean economies dependent on coastal tourism, assists in developing trained persons for ICAM issues in the region, and promotes south-south cooperation through the replication of best practices throughout the region. The project designs and implements training courses in ICAM for member countries as well as provides technical assistance through fellowships, seminars, and conferences. ICAM activities within IOCARIBE include ICAM training workshops with expertise provided by national institutions. As well, projects are developed and implemented with other Regional institutions and UN Agencies, particularly with UNEP and UNDESA

Website: http://iocaribe.ioc-unesco.org/

IBCCA - The International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico

Type of Marine Technology: process and methodologies; a, b
Recipients: Experts, students, policy makers, authorities
Duration: Continuous since 2006
Scope: Global and regional (Caribbean and adjacent regions)
Funding: IOC, IHO, Hydrographic and Cartographic services of Colombia, Costa Rica, Cuba, France, Mexico, USA and Venezuela

Description of TMT Activity: This is one of the projects part of the General Bathymetric Chart of the Oceans (GEBCO) initiative. IBCCA main objective is to create new bathymetry for the Caribbean Sea and the Gulf of Mexico. As the compilation of the majority of areas is nearing completion, the project is beginning to coordinate efforts to digitize existing geologic and geophysical maps with the intent of creating digital layers for new parameters.

Website: http://www.ngdc.noaa.gov/mgg/ibcca/

ACRONYMS

ABNJ	Areas Beyond National Jurisdiction
ANCA	Harmful Algae in the Caribbean and Adjacent Regions
BBNJ	Biodiversity Beyond Areas of National Jurisdiction
CBD	Convention on Biological Diversity
CGTMT	IOC Criteria and Guidelines on the Transfer of Marine Technology
CLME	Caribbean Large Marine Ecosystem
CMA	Caribbean Marine Atlas
CPPS	Permanent Commission for the South Pacific
CTDs	Conductivity Temperature Depth profilers
DBCP	Data Buoy Cooperation Panel
DOSI	Deep-Ocean Stewardship Initiative
DRMREEF	Enhance the Capacity for Species Identification and Genetic Analysis on Marine Organisms in the Coral Reef Ecosystems in the Western Pacific
EBSAs	Ecologically or Biologically Significant Marine Areas
GEBCO	General Bathymetric Chart of the Oceans
GEF	Global Environment Facility
GLOSS	Global Sea Level Observing System
HAB	Harmful Algal Blooms
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
ICAM	Integrated Coastal Area Management
ICGs	Intergovernmental Coordination Groups
IHO	International Hydrographic Organization
IOC	Intergovernmental Oceanographic Commission
IOC/ABE-LOS	IOC Advisory Body of Experts on the Law of the Sea
IOCAFRICA	IOC Sub-Commission for Africa and the Adjacent Island States
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IODE	International Oceanographic Data and Information Exchange
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
LDCs	Least Developed Countries
MOMSEI	Monsoon Onset Monitoring and its Social & Ecosystem Impacts
MSP	Marine Spatial Planning
MSR	Marine Scientific Research
OBIS	Ocean Biogeographic Information System
ODIN	Ocean Data and Information Network
ODINAFRICA	Ocean Data and Information Network for Africa
ODINBLACKSEA	Ocean Data and Information Network for the Black Sea region
ODINCARSA	Ocean Data and Information Network for the Caribbean and South America
ODINECET	Ocean Data and Information Network for European Countries in Economic Transition
ODIN-PIMRIS	Regional Network of Pacific Marine Libraries
ODINWESTPAC	Ocean Data and Information Network for the Western Pacific Region
OFDS	Ocean Forecasting Demonstration System
OTGA	OceanTeacher Global Academy
PACMEC	Promoting the Awareness on Coastal Marine Environmental Changes and its Impact
Rio+20	United Nations Conference on Sustainable Development
RTCs	Regional Training Centres
SEAGOOS	South East Asian Global Ocean Observing System
SIDS	Small Island Developing States
SPINCAM	Southeast Pacific Data and Information Network in Support to Integrated Coastal Area Management
TDA	Transboundary Diagnostic Analysis
TMT	Transfer of Marine Technology
TTR	Training-through-Research programme
UNCLOS	United Nations Convention on the Law of the Sea
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN-ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNISDR	United Nations International Strategy for Disaster Reduction
WESTPAC	IOC Sub-Commission for the Western Pacific
XBTs	Expendable Bathythermographs

United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

The Intergovernmental Oceanographic Commission (IOC) implements a variety of programmes and projects contributing to the transfer of marine technology through the following areas identified by the IOC Medium-Term Strategy 2014–2021:

Ocean research
Observing system / data management
Early warning and services
Assessment information for policy
Sustainable management and governance
Capacity development

Intergovernmental Oceanographic Commission (IOC)

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