Summary: Through SISTER (UNESCO System of Information on Strategies, Tasks and the Evaluation of Results), detailed quantitative and qualitative information is provided concerning the evaluation of progress in programme implementation:

- The period January 2008–May 2009 based on the UNESCO Programme and Budget 2008–2009 (34 C/5 Approved, Major Programme II, paragraphs 02000, 02021, 02024, 02026-02027, specifically for IOC; but see also, for more general aspects, paragraphs 02007, 02008, 02014-02015, 02020, 02022);

- The period July–December 2007 based on the UNESCO Programme and Budget 2006–2007 (33 C/5 Approved, Major Programme II.1.3, paragraphs 02130-02133, specifically for IOC, and paragraphs 02007, 02120, 02422, 08110 for activities in collaboration)
The General Conference

1. **Authorizes** the Director-General:

(a) to implement the plan of action for Major Programme II, structured around the following two biennial sectoral priorities and four main lines of action, with special emphasis on the needs of Africa, gender equality, youth, LDCs, SIDS and the most vulnerable segments of society, including indigenous peoples, focused on the contributions of science and technology to poverty eradication, peace and sustainable development, and reflecting actions to be undertaken under the relevant intersectoral platforms, in order to:

**Biennial sectoral priority 1: Promoting research and technical capacity-building for the sound management of natural resources and for disaster preparedness and mitigation**

[iii] strengthen the activities of the UNESCO Intergovernmental Oceanographic Commission (IOC), as the established intergovernmental body on oceans and coastal zones within the United Nations system, reinforcing its role in improving governance and fostering intergovernmental cooperation through ocean sciences and services in order to improve understanding of climate change and its impacts, including sea-level rise, ecosystem functioning and biodiversity; continue to observe and monitor the open ocean and coastal seas, to prepare policy recommendations for discussion by Member States, and to foster the development of institutional capacity for coastal and marine management and for marine scientific research with a view to contributing to sustainable development, in particular in developing countries, LDCs and SIDS, and to achieving the MDGs; and increase efforts to allocate resources for the benefit of Africa and LDCs, particularly with regard to the consequences of climate change;

[[...]]

(v) provide sufficient resources to IOC in order to facilitate the implementation of a Global Tsunami Warning System within its efforts to contribute to the development of national and regional capacities for disaster prevention, preparedness and mitigation, with a special emphasis on women, through a multi-hazard approach, and to assist in the establishment and development of tsunami early warning systems in the Indian Ocean, the Pacific Ocean, the Atlantic Ocean, the Mediterranean and connected seas, and the Caribbean and adjacent seas;

2. **Requests** the Director-General:

(a) to implement the various activities authorized by this resolution, to the maximum extent possible through intersectoral platforms;

(b) to report in the statutory reports on the achievement of the following expected results, including information on the cost-efficient use of human and financial resources, particularly in the areas of travel, publications and contractual services,
for each of the results reported, following the principles of transparency, efficiency and rationalization:

Main line of action 2: Oceans and coastal zones: improving governance and fostering intergovernmental cooperation through ocean sciences and services

- Management of ocean resources and coastal areas improved via development of policy-relevant information on impacts of climate change and variability on marine ecosystems and coastal zones
- Healthier ocean ecosystems and sustainable coastal and ocean environments achieved by means of development and dissemination of scientific research, better information and procedures on which policies may be based
- IOC Biennial Strategy 2008-2009 implemented and results achieved reported to UNESCO governing bodies

Main line of action 3: Promoting science, knowledge and education for disaster preparedness and mitigation, and enhancing national and regional coping capacities, including through support for the development of risk reduction networks and monitoring and assessment measures, such as tsunami early warning systems

- Risks from tsunamis and other ocean-related hazards reduced through early warning systems and preparedness and mitigation measures

Biennial sectoral priority 1: Promoting research and technical capacity-building for the sound management of natural resources and for disaster preparedness and mitigation

In the context of global changes, the role of the oceans in the earth system is of critical importance. UNESCO/IOC will catalyse new directions for improving climate change prediction and for its underlying science; monitor the changing ocean through ocean observation and process studies at the regional and global levels; build capacity for addressing the scientific issues and the challenges of coastal area management and monitoring; and improve livelihoods from healthy oceans and coasts through informed governance and strengthened intergovernmental cooperation. Earth observation and monitoring are essential for reducing scientific uncertainty about the role of the oceans in climate change as well as the effects of climate change on ocean processes and resources. UNESCO/IOC will continue to provide the lead for the Global Ocean Observing System (GOOS), which is the oceanographic component of the Global Climate Observing System (GCOS), reporting in this capacity to the United Nations Framework Convention on Climate Change (UNFCCC). GOOS supports operational ocean services worldwide through observation, modeling and analysis of marine and ocean data including living resources, providing valuable and often life-saving information to end-users. The societal benefits of improved ocean observation will remain at the centre of the actions carried out in the framework of GOOS. All activities under main line of action 2 are underpinned by capacity-building, as most international efforts in marine sciences incorporate a training and institutional development component. Coordination with other ISPs (for example in marine biosphere reserves or World Heritage sites) and other United Nations organizations (especially UNDP, UNEP, FAO, IMO, IAEA and WMO) will primarily consist of
management efforts in field projects. A communication strategy will be developed to promote awareness of ocean issues and the importance of ocean sciences. [MLA 2]

[...]

UNESCO/IOC was mandated by the United Nations as the lead agency for coordinating the planning and implementation of tsunami early warning and mitigation systems, based on its accumulated experience of four decades of coordinating the Pacific Tsunami Warning System. In 2008–2009, IOC will consolidate the establishment of the Indian Ocean Tsunami Early Warning and Mitigation System. It will also expand this mechanism to other regions and will coordinate a global system in line with the UNESCO Strategy for Establishing a Global Tsunami Warning System. All such systems will apply an integrated multi-hazard approach, and will therefore include preparedness and awareness components besides the detection networks and risk assessment. [MLA 3]

Main line of action 2: Oceans and coastal zones: improving governance and fostering intergovernmental cooperation through ocean sciences and services

Expected results at the end of the biennium

Management of ocean resources and coastal areas improved via development of policy-relevant information on impacts of climate change and variability on marine ecosystems and coastal zones.

- Degree of complete implementation of the open ocean module of the GOOS
  
  Benchmark end 2009: 62% of system (composed of a network of buoys, moorings, floats, tide gauges, and repeat ship of opportunity hydrographic lines) set up – baseline: 58%)

The 3,000th GOOS Argo float was deployed in January 2008. The climate module of GOOS in the framework of JCOMM achieves 60% of the open-ocean observing system planned for completion by 2012. The initial goals of GOOS are being met, but at a slower rate than originally planned and timely completion of the 2012 target goals do not seem plausible.

The degree of completion of the ocean observing system for climate was presented to the parties of the UN Framework Convention on Climate Change in June 2009. The CLIVAR decadal hydrographic survey will be approximately 85% complete in early 2008.

The 4th Forum of GOOS regional alliances was held and substantial effort was made towards the development of Arctic and Southern Ocean regional observing systems as sustained legacies of the International Polar Year. The first PIRATA cruise was planned and completed. OCEATLAN meeting held.

Substantial effort was made together with co-sponsors and partners towards establishing GOOS as the ocean component of GEOSS and WIGOS/WIS.

1 Policy Brief on sea level established and disseminated

A Sea level brief is under preparation. Draft terms of reference for a regular process to update the sea level brief is under development and will be reported to 25th IOC Assembly (June 2009).
Number of new cases where results from IOC globally-coordinated or sponsored ocean-related climate research and forecasts have been applied to address national priorities in climate assessment, adaptation, or mitigation

- **Benchmark end 2009: 10 countries**

  Second Ocean in a High CO\textsubscript{2} World Symposium under the high patronage of His Serene Highness Prince Albert II was held in October 2008. 220 scientists from 32 countries met to assess what is known about ocean acidification, and published a Summary for Policymakers, Research Priorities Report, and the Monaco Declaration. The development of a “Guide to Best Practices for Ocean Acidification Research” was initiated.

  IOC has organized with ICES and PICES the International Symposium on the Effects of Climate Change in the World’s Oceans. This Symposium was held in Gijón (Spain) in May 2008 and was attended by 400 experts from 48 countries. IOC has worked in the preparation of the scientific programme which included 4 workshops and 10 thematic sessions. Scientific sessions accommodated a total of 215 oral presentations (10 plenary talks and 20 invited speakers included). This International Symposium was the first of the worldwide Symposia in this great concern and represented an important opportunity to further develop the truly international nature of research related to the effects of climate change on the world’s oceans. It was remarked the importance of this symposium as a firm step towards close cooperation between marine researchers working in different disciplines related with climate change and the sustainability of marine ecosystems.

  West Africa project on Adaptation to Climate Change in Coastal Zones (ACCC) officially launched in November 2008, in collaboration with UNDP and funded by the Global Environment Facility. The following countries are benefiting: Senegal, Mauritania, Gambia, Guinea Bissau and Cape Verde.


  Co-organisation of the World Conference on Marine Biodiversity (Valencia, 11–15 November 2008). It was attended by 500 researchers and scientists and it focused on the review of the current understanding of marine biodiversity, its role in marine ecosystem functioning and its socio-economic context. It provided an assessment of current and future threats and potential mitigation strategies for conservation and regulation of marine resources.

  **Healthier ocean ecosystems and sustainable coastal and ocean environments achieved by means of development and dissemination of scientific research, better information and procedures on which policies can be based.**

- Progress achieved in global monitoring of the oceans

  - **Benchmark end 2009: assessment of assessments phase of the regular process for global reporting and assessment on the state of the marine environment completed and transmitted to the United Nations General Assembly**
Assessments of Assessments (AoA) report finalized and submitted to the UN General Assembly following seven meetings of the AoA Group of Experts organized between March 2007 and 2009. The draft AoA report was peer-reviewed and presented to the Ad Hoc Steering Committee in April 2009 (UNESCO, Paris) for transmission to the UN General Assembly in the autumn of 2009. Supporting activities include: the establishment of a functional on-line virtual office to facilitate the exchange of resources among the members of the Group of Experts; a website (www.unga-regular-process.org) to inform Member States on the progress of this project; a dedicated brochure, and a database of existing marine assessments (GRAMED) containing more than 400 individual entries.


The largest global dataset of surface ocean carbon ever assembled was developed, in a common format and publicly available, to improve studies of ocean uptake of anthropogenic CO₂.

- Number of countries with strengthened scientific capabilities to understand, forecast and manage marine and coastal environmental problems

  Benchmark end 2009: 3 new local and regional initiatives utilizing IOC management guidelines and results from IOC coastal research activities

  A draft plan for an integrating activity on integrated coastal research on direct human influences on coastal ocean functioning and ecosystem health was prepared and extra-budgetary funding identified for expert workshop organised from 2–4 February 2009, Paris.

Regarding Harmful Algae Blooms: Progress as foreseen: 1 GEOHAB Core Research Project Plan published; A Special issue of the Elsevier Journal ‘Harmful Algae’, HABs and Eutrophication published; 1 cross-disciplinary HAB modelling workshop successfully planned and extra-budgetary funded for implementation in June 2009. 3 International training workshops, 2 capacity enhancing expert workshops and 1 meeting of regional network (FANSA South America) implemented.

GEOHABAsia launched to develop cooperative regional research that will deliver improved understanding and modelling capabilities of harmful marine algal events and patterns of nutrient input to coastal ecosystem

Global-NEWS and GEOHAB Core Research Draft plan for integrating activity prepared and extra-budgetary funding identified for expert workshop organised from 2–4 February 2009, Paris.

Regarding ‘Marine Modelling’ expected results have been achieved: A scoping activity is completed. A post-GODAE team within JCOMM (the Expert Team on Operational Ocean Forecast Systems) had a first meeting in November 2008 to prepare a white paper on the future of GODAE and the GODAE Final Symposium roundtable on future activities in research for ocean forecasting was also held November 2008.

Global Coral Reef Monitoring Network: Training was conducted in association with Reef Check and World Fish Center with ecological and socioeconomic training held in more than 38 countries. ‘Status of Caribbean Coral Reefs after

- 30 countries in 4 regions supported in the management of coastal and marine resources through capacity-building and increased access to available ocean data and information products.

  - 15 workshops (cumulative) for strengthening marine science institutes; 2 networks of UNESCO/IOC Chairs partnering in implementing regional projects; 10 new countries joining regional ocean data and information networks

Capacity Development activities were conducted in two streams: (i) Self-driven Capacity-development Programme, and (ii) Research and education through the longstanding TEMA Programme.

(i) Eight Self-driven capacity development workshops include:

- Two Leadership Workshops in the IOCEA, IOCINDIO and IOCWIO regions involving 13 and 10 countries respectively.
- One training course co-sponsored with the COAST-MAP-IO project involving 9 countries and focused on multi-beam sonar, GIS and inundation mapping for the Indian Ocean.
- Four Bid-writing workshops for the IOCEA, IOCARIBE (2) and IOCINDIO/WESTPAC involving 5, 10 and 10 countries respectively focusing on developing competitive transboundary project proposals for each of the regions and;
- One Decision Support Tools (DST) workshop conducted in Nairobi (IOCWIO) involving 5 countries and focussing on hydrodynamic modelling. Appropriate DST software and data allowed institutes to communicate effectively with policymakers and cost-effectively research many marine issues of national priority.
- Feedback from participants indicates that the presentation of methods and best practices for director’s to work and grow their leadership was very useful and inspiring as was the opportunity to develop regional networks of marine scientists and institutions. The development of DST

(ii) TEMA Programme:

- Four Training-Through-Research (TTR) activities with participation from about 60 young researchers in marine sciences from over 25 countries including (a) the TTR-17 cruise; (b) Baltic Floating University cruise; (c) three 4-week long University of the Sea (UoS) cruises; (d) TTR-Flanders/UNESCO project wrap-up workshop on cold-water carbonate mounds.
- Four UNESCO/IOC Chairs in Marine Sciences in Russia (2), Chile and Mozambique helped provide post-secondary research opportunities for more than 200 advanced students in 2008 by coordinating the TTR
cruises, providing specialized and regular courses, organizing post-cruise conferences, workshops and other academic activities.

IOC Strategic Plan for Oceanographic Data and Information Management implementation started through coordination activities with IOC/HAB, SCOR, JCOMM and OBIS. Agreement reached with WMO on linking of Ocean Data Portal prototype with WIS through JCOMM Pilot Project for WIGOS. Joint Steering Group for the IODE Ocean Data Portal (ODP) and the WIGOS Pilot Project for JCOMM established. New Ocean Data Portal software developed. Training Course organized.

Standardization in ocean data exchange effort started through Ocean Data Standards Pilot Project. First standard identified for review.


IODEx network reaches 76 IODE National Coordinators for Data Management and 35 IODE National Coordinators. OceanExpert clearinghouse for ocean professionals reaches 11,500 entries and OceanDocs electronic repository of indigenous publications reaches 2,307 records (Africa, Latin America, Eastern Europe). Between January 2008 and May 2009, a total of 8 training courses in ocean data and information management were organized at the IOC Project Office for IODE, Oostende, involving 118 trainees.

- Number of countries applying integrated approaches to the management of coastal and marine resources

  - Benchmark end 2009: guidelines for ecosystem-based marine spatial planning tested in one biosphere reserve; development of: (i) indicator-based state of the coast reports and (ii) decision support tools for integrated coastal area management supported in 5 countries; 4 countries assisted to formulate integrated management approaches for coastal groundwater within the local integrated coastal area management framework

SPINCAM project, aimed to develop indicators and State of the Coast reports for the Pacific rim of Latin America (Chile, Colombia, Ecuador, Panama, Peru), was launched in Guayaquil, Ecuador, in June 2008, in collaboration with CPPS.

The Marine Spatial Planning Project, in collaboration with MAB has been completed in June 2009, thanks to funding from Moore and Packard foundations. A meeting of experts was held in March. The guidelines on MSP have been tested through two workshops in the USA (Massachusetts) and Viet Nam (Hanoi and Halong Bay). The Guidelines have been published and are available on the IOC website (http://www.unesco-ioc-marinesp.be/).

Publication of the Large Marine Ecosystem (LME) Report “A perspective on changing conditions in LME of the World’s regional seas” by UNEP which is
the result of a long standing partnership among several UN organizations, including the IOC.

**IOC Biennial Strategy 2008–2009 implemented and results achieved reported to UNESCO governing bodies.**

This expected result refers to the whole complex of IOC activities within the 34 C/5; progress in this regard will be reported at the next General Conference of UNESCO in October 2009. Reporting is ongoing for the IOC 25th Assembly (June 2009). The IOC Biennial Strategy 2008–2009 is embedded in the approved 34 C/5 therefore reporting for both the General Conference/Executive Board and the IOC Assembly are consistent while with different level of aggregation.

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**Main line of action 3:** Promoting science, knowledge and education for disaster preparedness and mitigation, and enhancing national and regional coping capacities, including through support for the development of risk reduction networks and monitoring and assessment measures, such as tsunami early warning systems

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**Expected results at the end of the biennium**

**Risks from tsunami and other ocean-related hazards reduced through early warning systems and preparedness and mitigation measures.**

- Number of regional early warning systems for tsunamis and other ocean-related hazards operational
  - Benchmark end 2009: 4 regional tsunami systems operational (*Mediterranean and Caribbean seas*) or strengthened (*Pacific and Indian Ocean*) as part of the *global multi-hazard warning system*

  Extended support to all Intergovernmental Coordination Groups (ICGs) for Tsunami technical matters and capacity building to Member States; technical support groups optimized in view of future merge; Secretarial support and assistance provided to ICGs, enhanced interaction with all stakeholders, including NGOs and IGOs.

  **Pacific Ocean:** The 23rd ICG/PTWS session was hosted by Samoa, 16–18 February 2009. The medium-term strategy was adopted, redefining the goals, objectives and working group structure in view of the pending TOWS review. At the UNESCO Office in Apia, an IOC National Officer is being established to support tsunami-related activities in the SW Pacific.

  **Indian Ocean:** The 6th Session of the ICG/IOTWS was hosted by India in Hyderabad, 7–9 April 2009.

  **Caribbean:** Core network of seismic stations and core network of sea level stations agreed on; data from core network of seismic stations to be freely available to national, regional and tsunami warning centres for production of tsunami and other early-warning information. CARIBE-EWS Implementation Plan finalized. National and regional structures and responsibilities defined, preparation for operational phase well in advanced.

  **NE Atlantic and Mediterranean:** The 5th Session of the NEAMTWS was held in Athens. A Secretariat was established in Bonn, Germany.
- Number of preparedness materials produced or communities at risk educated with respect to natural hazards impact prevention, preparedness and mitigation measures

- **Benchmarks end 2009:** 6 culturally adapted and gender-responsive tsunami preparedness educational materials produced in different languages; 1 community per regional warning system (4) educated in disaster prevention, mitigation and preparedness

A revised *TsunamiTeacher* awareness package is available on the internet.

Training courses held:
- **ITSU Training Programme** (Honolulu, Hawaii, 5–7 November 2007 and 26 December–5 January 2008)

Tsunami Capacity Development assistance provided to Mauritius and Mozambique.

Distribution of materials and tools including earthquake and sea level monitoring tools, PTWC heads-up SMS alerts, travel time calculation software and historical databases in addition to tsunami awareness materials of the ITIC that had been updated in 2006. Translations of a number of materials have been provided by countries including French, Spanish, Chinese, Indonesian and Thai.

The Group of Experts developing the Guidelines to mainstream awareness and mitigation of marine hazards through ICAM had their last meeting in April 2008. The final Guidelines were published and distributed to Member States in May/June 2009. These Guidelines are a result of the collaboration with WMO, UNEP, UNU-EHS and NOAA.

The COAST-MAP-IO Project has initiated its activities, following the kick-off meeting organized in Bangkok (October 2007). Seven training courses for improving data acquisition, coastal modelling and inundation mapping capacities in the Indian Ocean have been held:

- **Tsunami Numerical Modeling Course II** in Jakarta, Indonesia involving five representatives from five countries (Madagascar, Mauritius, Mozambique, Myanmar, Tanzania), 25–31 August 2007 in the framework of the cooperation between COAST-MAP-IO and ICG/IOTWS.

- **Advanced Training Course on Bathymetric Data Acquisition, processing, management and multibeam** in shallow water areas was conducted by the National Hydrographic School (NHS) of the Indian Navy on 15–29 March 2008 in Goa, India.

- **GIS and Inundation Mapping** was conducted by Training and Education Centre Hydrography at Alfred Wegener Institute for Polar and Marine Research (TECHAWI), from 22 April–6 May 2008 in Bremerhaven, Germany.

- **Advanced Hydrographic Survey Training course on Multibeam and single beam data acquisition, processing and management** conducted by Training and Education Centre Hydrography at Alfred Wegener Institute
for Polar and Marine Research (TECHAWI), from 16–31 September 2008 in Bremerhaven, followed by free of charges 3-day practical hydrographic survey in shallow water areas around Bremerhaven on board of R/V Kiek Ut.


- Training on CARIS software was organized and successfully conducted on 16–20 March 2009 in Bangkok hosted by Hydrographic Department of the Royal Thai Navy.

- 2nd Training on Multibeam and single beam data acquisition processing and management were organized and successfully conducted by the National Hydrographic School of the Indian Navy in Goa on 6–18 April 2009.

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Progress with the 33 C/5 (July-December 2007) ¹

Programme and Budget for 2006–2007 (33 C/5)

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<th>02130</th>
<th>UNESCO Intergovernmental Oceanographic Commission:</th>
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The General Conference **Authorizes** the Director-General:

(a) to implement the corresponding plan of action pertaining to the UNESCO Intergovernmental Oceanographic Commission (IOC) in order to:

(i) improve scientific knowledge and understanding of oceanic and coastal processes with a view to assisting Member States in the design and implementation of sustainable policies for the ocean and coastal zones, through the organization and coordination of major scientific programmes, responding to the mandate of the United Nations Law of the Sea (UNCLOS), Chapter 17 of Agenda 21/the United Nations Conference on Environment and Development (UNCED), the Barbados Programme of Action for the Sustainable Development of Small Island Developing States, the Johannesburg Plan of Implementation (JPOI) adopted at the World Summit on Sustainable Development (WSSD), the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, the Millennium Development Goals and the relevant regional conventions and programmes;

(ii) continue the development of operational oceanography and information and data systems through the Global Ocean Observing System (GOOS), the International Oceanographic Data and Information Exchange programme (IODE) and the IOC/WMO Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM);

(iii) coordinate the establishment of a tsunami warning system in the Indian Ocean region, building upon the 40-year experience of the Tsunami Warning System for the Pacific;

(iv) strengthen the capacities of Member States to monitor and predict the transfer of harmful algal species and other introduced non-native species by oil tanker traffic;

(v) continue the implementation of regional coastal management projects contributing to the operational phase of the African Process in the framework of the environment component of the New Partnership for Africa’s Development (NEPAD);

(vi) answer the call to the IOC contained in the Johannesburg Plan of Implementation to support the development of permanent capacities in ocean sciences, services and observations by Member States of IOC, contributing towards building the capacities of

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¹ The information provided below updates document IOC-XXIV/2 Annex 3 Add. 1 dated 2 May 2007.
developing countries to establish science-based management systems for the coastal resources and ecosystems in their exclusive economic zone;

(b) to allocate for this purpose an amount of $3,821,600 for programme costs and $54,800 for indirect costs at the Headquarters.

Main line of action 1: Addressing scientific uncertainties for the management of marine environment and climate change

Expected result: International cooperation reinforced on scientific research in marine environment.

Progress achieved as related to performance indicators:

(i) Number of publications and references to IOC documents in UN documents and in the scientific and international literature:


Surface Ocean CO₂ Variability and Vulnerability, Deep-Sea Research II special issue.


World Resources Institute / EarthTrends 2007 article references the Ocean Acidification Network. (http://earthtrends.wri.org/updates/node/245). The Pew Charitable Trusts report “Carbon Dioxide and Our Ocean Legacy” refers to the Ocean in a High CO₂ World web information (now the ocean-acidification network).

The IOCCP email / web contact list grew from 180 to over 260 in the last half of 2007. IOCCP published the Ocean Acidification Network (http://www.ocean-acidification.net/)—an information network for the research community.

(ii) Quality of participation in IOC Conferences, meetings, panels and working groups:

IOCCP became a partner in 2 new EU Framework 7 Research Programmes with the goal of providing international (non-EU) coordination: European Ocean Acidification Project and the Coordinated Action for a Carbon Observing System. In 2008.

GEOHAB Core Research Projects in Eutrophic and Stratified Systems launched.

VOS carbon networks re-assessed by over 100 scientists from 20 countries in 2007, with new on-line tables and maps developed for international coordination.

IOCCP established the Global Ocean Ship-based Hydrographic Investigations Panel (GO-SHIP) to develop a global strategy for post-CLIVAR hydrography.

IOCCP established the Surface Ocean CO₂ Atlas (SOCAT) project to develop a common format global data set of publicly available surface pCO₂ data that will be the basis of an operational data management system. Regular gridded data products will be developed from this database.

International committee formed to implement the 2nd Ocean in a High CO₂ World symposium to assess what is known about ocean acidification. Symposium held in October 2008.
IPHAB established a joint IPHAB-IODE Task Team to develop a world wide harmful algal information system as a one-stop access to HAB data.

**Expected result: Capacity of Member States improved to implement Integrated Coastal Area Management.**

**Progress achieved as related to performance indicators:**

(i) **Tools and guidelines for Integrated Coastal Area Management:**

A Group of Experts was established to develop guidelines to mainstream awareness and mitigation of marine hazards through integrated coastal area management; three meetings were held (Paris, April 2007; Lisbon, October 2007; Paris, April 2008). The guidelines were expected to be finalized in the Fall of 2008.

Following an international workshop held in 2006 on Marine Spatial Planning (MSP), a project to develop a set of international guidelines on MSP was approved in October 2007.

(ii) **Application of IOC guidelines for ICAM plans:**

The Handbook for measuring the progress and outcomes of integrated coastal and ocean management was translated into Arabic, Chinese, Portuguese and Vietnamese by different organizations, international (PERSGA), national (Brazilian Ministry of Environment), and local (provincial authorities in China and Viet Nam) for application at different scales.

A project proposal to develop an ICAM indicator framework in 5 countries of Latin America, in collaboration with CPPS has been submitted for funding.

(iii) **ICAM projects carried out:**

The GEF/UNDP PDF-B project on Adaptation to Climate Change in Coastal Zones (ACCC) was implemented in Cape Verde, Gambia, Guinea Bissau, Mauritania and Senegal; the full project (US$ 4 million) is expected to start within the year. A preparatory meeting was held in Praia, Cape Verde in November 2007.

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**Main line of action 2: Developing operational capabilities for the management and sustainable development of the open and coastal ocean**

**Expected result: Coordination of the provision and use of ocean observations, data and warning services enhanced.**

**Progress achieved as related to performance indicators:**

(i) **Enhanced international collaboration to observe the global oceans and coasts:**

The GLOSS Group of Experts has played a leading role in the upgrade of the global network of sea level stations and in particularly in the Indian Ocean. The number of operational sea level stations grew by more than 25 units.

In Cooperation with YSLME and NOWPAP, Regional bio-optical dataset and Yellow/Sea China Case-2 algorithm has been developed under the WESTPAC-Remote Sensing Project. The Strategic Plan for NEAR-GOOS at its second phase was published.
(ii) **Improved accessibility to ocean data, both historical and real time operational:**

IOC Assembly (June 2007) adopted the *IOC Strategic Plan for Oceanographic Data and Information Management* through Resolution XXIV-9, thereby creating a cross-cutting approach to IODE operations and IOC ocean science and observation programmes.

IODE was successfully reviewed by UNESCO/IOS. Follow-up actions were discussed by the IODE Officers meeting (November 2007).

The deployment of the IODE Ocean Data Portal continued with the organization of a first training course (October 2007).

The Oceans Biodiversity Conference (2007) was held in Dartmouth, Canada (October 2007) with over 100 participants.

Following the success of the African Marine Atlas, 9 small island States in the Caribbean region decided to develop the Caribbean Marine Atlas (October 2007). Start-up funds were secured.

The ODINAFRICA Project Steering Committee reviewed progress and started planning for a fourth phase of the project that will focus on increased services for coastal zone management and decision support as well as continued support of the GLOSS sea level stations that support the IOTWS.

(iii) **Protection of vulnerable coastal communities to ocean related hazards, in particular tsunamis:**

While 6 training courses and workshops on inundation modelling, bathymetric data processing, hazard assessment and tsunami watch information in the Indian Ocean region had been conducted, 4 intersessional ICG/IOTWS working group meetings were held. Technical support has been provided through several country visits, instrumentation provision, and an assessment mission to Timor Leste.

In the Western Pacific, new regional projects related with natural hazards were established; the 7th WESTPAC International Scientific Symposium will take place on 21–25 May 2008, with the theme of “Natural Hazards and the Changing Marine Environment in the Western Pacific”. WESTPAC is assisting the IOC Headquarters in implementing the Adaptive Learning in Disaster Management for Community Awareness and Resilience (ALDCAR) in Thailand.

Main line of action 3: **Capacity of Member States in marine science for the coastal ocean strengthened**

**Expected result:** Marine scientific research capacities enhanced.

**Progress achieved as related to performance indicators:**

(i) **Level of capacity-building interventions steered and harmonised according to IOC capacity-building principles:**

Principles for Capacity-Building were formulated and endorsed by the 23rd IOC Assembly in 2005 (Resolution XXIII-10).

Guidelines and procedures on the IOC/UNESCO Regional Training and Research Centre in the Western Pacific on Oceanography were drafted.
(ii) **Level, number, and type of capacity-building interventions using technology for synoptic understanding and prediction of the coastal ocean:**

Harmonisation of activities with IOTWS fellowships through training of students in use of coastal modelling for both safety in coastal zones and applications to high priority local coastal issues in Kenya and Mozambique. Finalisation of the IOCWIO proposal with important coastal modelling components, and submission of two coastal-modelling proposals in Kenya and Tanzania.

(iii) **Level, number, and type of capacity-building interventions empowering IOC constituencies:**

First team-building workshop for the Western Indian Ocean region, 2nd leadership and 1st team-building workshops for the Eastern Atlantic region, and first team-building and first proposal-writing workshop for the Latin American and Caribbean region were conducted.

Expected result: Capacities built to implement the articles on Marine Scientific Research (Part XIII) and Transfer of Marine Technology (Part XIV) of UNCLOS.

**Progress achieved as related to performance indicators:**

(i) **Technical, legal and scientific information provided:**

Compilation of national legislation and analysis of Member States’ practices in marine scientific research has been made available through the internet.

(ii) **Technical advice provided:**

A roster of nationally-designated experts was established to promote and facilitate the development and conduct of marine scientific research.

(iii) **Capacity-building modalities implemented:**

Through a dedicated website, demands for marine technology transfer from Member States can be circulated.

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**02007 Natural Sciences**

*Links between the six scientific intergovernmental programmes – IGCP, IHP, IOC, MAB, IBSP and MOST – will be strengthened, in particular through joint field pilot projects.*

(For cooperation with MAB and IHP see document IOC/EC-XLI/2 Annex 7.)

**02120 Natural Sciences**

*Ecological and Earth Sciences for Sustainable Development:*

**Strategic Approaches**

*Global Earth Observation for sustainable development will be pursued through inter-disciplinary activities involving the intergovernmental science programmes (IGCP, IHP, IOC and MAB) as well as MP I and MP IV.*

(Please see related sections on GOOS.)

**02422 Natural Sciences**

*Capacity-building in science and technology for sustainable development*

*Science and technology policies and technology for sustainable development*
Community-based information portals on oceans for the African, Latin American, and Caribbean regions

The UNESCO/IOC community-based ocean sub-portals for the African, Latin American and Caribbean regions aim, as part of UNESCO’s knowledge portal, to facilitate access to information and data on all aspects of ocean and coastal research and management.

Expected result: Portals recognized by local and international stakeholders as reference information tool on oceans and coastal areas; knowledge base on ocean/coastal areas related issues improved; agreements on transfer of ownership of the Portals to partner organizations reached.

Progress achieved as related to performance indicators:

Usage of African ocean portal has increased due to recognition by local and international stakeholders. The chief editor of portal was invited to meetings of the UNEP Clearing House Mechanism for Western Indian Ocean, UNEP/GEF WIOLab project, and the African Coelacanth Project. Knowledge objects doubled to more than 4,280, topics to more than 280 and the site visits to more than 22,600. Twelve issues of the COSMARNews newsletter was produced and circulated in collaboration with NEPAD/COSMAR to publicize the portal.

In Latin America, there was an increase by 200% of number of editors/content providers to better cover the information needs of all focus audiences. Training was provided to editors in “science writing” through a specific tutorial. Publication of printed newsletters as well as national public awareness campaigns continued.

08110 Communication and information
Summary of intersectoral action and mainstreaming issues

Disaster prevention and preparedness, including tsunami warning system

Expected result: Tsunami warning and disaster preparedness integrated into national science curricula and community education programmes, especially in countries at high risk of earthquakes, floods and tsunami.

Progress achieved as related to performance indicators:

(See other sections on the tsunami warning and mitigation systems.)