

**Intergovernmental Oceanographic Commission**  
*Reports of Governing and Major Subsidiary Bodies*



# **Twenty-third Session of the Assembly**

Paris, 21–30 June 2005

**UNESCO**

In this Series

Languages

**Reports of Governing and Major Subsidiary Bodies**, which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:

1. Eleventh Session of the Working Committee on international Oceanographic Data Exchange E, F, S, R
2. Seventeenth Session of the Executive Council E, F, S, R, Ar
3. Fourth Session of the Working Committee for Training, Education and Mutual Assistance E, F, S, R
4. Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment E, F, S, R
5. First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions E, F, S
6. Third Session of the *ad hoc* Task team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime E, F, S, R
7. First Session of the Programme Group on Ocean Processes and Climate E, F, S, R
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10. Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific
11. Nineteenth Session of the Executive Council, Paris, 1986 E, F, S, R, Ar
12. Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment E, F, S
13. Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange E, F, S, R
14. Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Havana, 1986 E, F, S
15. First Session of the IOC Regional Committee for the Central Eastern Atlantic, Praia, 1987 E, F, S
16. Second Session of the IOC Programme Group on Ocean Processes and Climate E, F, S
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## 1. OPENING

1 Prof. David Pugh, Chairman of IOC, opened the 23rd Session of the IOC Assembly at 10.00 hours on Tuesday 21 June 2005. The Chairman asked the participants to stand in silence for one minute as a mark of respect for the Asian tsunami victims and for the distinguished individuals who have collaborated with the Commission and have passed away during the last intersessional period: Louis Vermaak (South Africa); Bob Stewart (Canada); Christian LeProvost (France); Dorothy Bergamaschi (USA); Alexander Suvorov (Ukraine). He welcomed the three new Member States that had joined IOC: Czech Republic, Kazakhstan and Serbia and Montenegro.

2 The Director-General of UNESCO addressed the Assembly. He pointed out the leading role of UNESCO and its IOC in the International Community in establishing a tsunami warning system for the Indian Ocean based on the unequalled experience gained from operating such a system in the Pacific Ocean since 1965. He emphasized the effort of the IOC of UNESCO manifested by the coordination of two relevant meetings: the first "International Coordination Meeting for the Development of Tsunami Warning and Mitigation System for the Indian Ocean within the Global Framework", UNESCO Headquarters, France, 3–8 March 2005, and the second "International Coordination Meeting for the Development of Tsunami Warning and Mitigation System for the Indian Ocean", Mauritius, 14–16 April 2005, which established emergency measures to broadcast interim tsunami advisory information to the countries in the Indian Ocean, supporting the establishment of national tsunami information centres to receive this information and upgrading existing observational networks to enable them, within the next six months, to detect tsunamis.

3 He also stressed that the 23rd Session of the IOC Assembly represented an important milestone in the establishment of the Indian Ocean Tsunami Warning System. He reminded Member States that there are two functions that are part of the mission of IOC: to produce knowledge and to apply knowledge; and he added that, to succeed in this second aspect of IOC's mission, IOC needs to emphasize the intergovernmental nature of its remit by improving the coordination with governments.

4 The Director-General stressed the importance of UNESCO and IOC being able to attract a significant flow of extra-budgetary, voluntary contributions and encouraged Member States to give it serious consideration. He further noted that IOC has very broad and useful financial mechanisms defined in Article 10 of its statutes and invited the Member States of the IOC to make use of them. He finally recognized that, even if IOC has a well-established reputation, as noted in the last session of the UNESCO's Executive Board, events have shown that it is necessary to build a stronger IOC, leaving that possibility in the hands of the Member States active in the Commission.

5 The Director-General's full statement is in Annex III.

## 2. ORGANIZATION OF THE SESSION

### 2.1 ADOPTION OF THE AGENDA

6 The Executive Secretary introduced this item. He pointed out that two items had been withdrawn from the original provisional agenda: one on the Fourth Session of the IOC Regional Committee for the Indian Ocean which has been postponed to later this year, owing to a low response to the initial invitation; the other was the progress report on the evaluation of the

Tsunami Programme which was suspended, owing to the Indian Ocean tsunami catastrophe of 26 December 2004.

7 He reminded the Member State representatives that the formal and final deadline for informing the Executive Secretary of their nominations for the elections of Officers and Members of the Executive Council was Wednesday 22 June 2005 at 18.00 hours. Similarly, he reminded the plenary that the final deadline for the submission of Draft Resolutions was Saturday 25 June 2005 at 13.00 hours.

8 **The Assembly adopted** the Agenda, which is in Annex I.

## 2.2 DESIGNATION OF THE RAPPORTEUR

9 The Chairman invited the Assembly to designate the Rapporteur for the present session to assist the Chairman and the Executive Secretary in the preparation of the Draft Summary Report. India proposed Australia as the Rapporteur. The Australian Delegation nominated Dr Peter Dexter to be the Rapporteur.

10 **The Assembly accepted** the proposal and **welcomed** Dr Dexter as Rapporteur for the present session.

## 2.3 ESTABLISHMENT OF INTRASESSIONAL COMMITTEES

11 **The Assembly established** sessional committees pursuant to the recommendations of the 38th Session of the IOC Executive Council, as follows:

- (i) Nominations Committee, under the chairmanship of Dr Peter Koltermann (Germany), comprising: Brazil, Chile, China, Germany, Greece, Japan, Mexico, Nigeria, Russian Federation, Spain, USA, Venezuela.
- (ii) Resolutions Committee, under the chairmanship of Geoff Holland (Canada), comprising: Argentina, Australia, Canada (Chairpersonship), Chile, China, France, India, Japan, Republic of Korea, Mexico, Norway, Peru, Russian Federation, UK, USA.
- (iii) Programme and Budget Committee, under the chairmanship of Captain Javier Valladares (Argentina), Vice-chairman responsible for finance matters; open ended, comprising: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Japan, Mexico, Portugal, Russian Federation, Sweden, Turkey, UK, USA.

12 **The Assembly also established** the following open-ended working groups:

- Sessional Working Group to work on the final version of the Terms of Reference of the Intergovernmental Committee for GOOS (I-GOOS), the GOOS Scientific Steering Committee (GSSC) and the GOOS Project Office (GPO), under the chairmanship of Dr K. Radakrishnan (India), Vice-chairman responsible for operational oceanography, comprising: Argentina, Australia, Belgium, Brazil, Canada, Chile, China, Cuba, Finland, France, Germany, India, Iran, Italy, Japan, Republic of Korea, Mexico, Nigeria, Portugal, Russian Federation, South Africa, Turkey, UK, USA.
- Sessional Working Group on the IOC contribution to the establishment of a Global Tsunami Early Warning System, under the chairmanship of Dr A. Frolov (Russian

Federation), Vice-chairman responsible for international oceanographic data and information exchange, comprising: Argentina, Australia, Brazil, Canada, China, Colombia, Cuba, Ecuador, Finland, France, Germany, India, Indonesia, Iran, Italy, Japan, Republic of Korea, Malaysia, Mexico, Nigeria, Norway, Peru, Portugal, Russian Federation, South Africa, Spain, Sweden, Turkey, UK, USA. The Representative of IHO was welcomed as an Observer.

- Sessional Working Group on the Concept Paper on the Modalities of Implementation of IOC Programmes in Regions, under the chairmanship of Prof. Mario Ruivo (Portugal), Vice-chairman responsible for regional affairs, comprising: Argentina, Australia, Belgium, Canada, China, Cuba, Finland, India, Japan, Nigeria, Peru, Poland, Portugal, USA.
- Following a proposal from Australia, a Sessional Working Group to work on the resolution for the establishment of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS) and related matters, under the chairmanship of Australia, comprising: Canada, France, Germany, India, Indonesia, Iran, Italy, Japan, Kenya, Madagascar, Malaysia, Mauritius, Thailand, South Africa, Sri Lanka, Viet Nam.

#### 2.4 INTRODUCTION OF DOCUMENTATION AND TIMETABLE

13 The Executive Secretary introduced the documentation. In addition to explaining the list of working documents, he highlighted four information documents also available to the delegates:

- The IOC Annual Report, 2004;
- The IOS Audit Report on Intergovernmental Oceanographic Commission (IOC): Special Account and controls generally (IOC/INF-1204);
- Report of the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework, UNESCO Headquarters, France, 3–8 March 2005 (IOC Workshop Report, 196);
- Report of the Second International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean, Mauritius, 14–16 April 2005 (IOC Workshop Report, 198).

14 The Chairman invited the Assembly to adopt the Second Revised Provisional Timetable taking into account: (i) the adopted agenda and the important items to be discussed which may require extra time to be debated; (ii) the time likely to be required by the sessional committees and working groups before reporting to the plenary; (iii) the preparation of the Draft Summary Report in all the Commission's working languages; and (iv) the need to benefit from interpretation.

15 **The Assembly adopted** the Provisional Timetable.

16 The List of Documents is in Annex IX.

## 2.5 ANTON BRUUN AND N.K. PANIKKAR MEMORIAL LECTURES

- 17 The Chairman reminded the Assembly that the IOC A. Bruun and N.K. Panikkar Memorial Lectures were initiated in 1970 and 1995, respectively. The IOC has decided to mint a medal in honour of Anton Frederick Bruun, with a view to awarding it to future Bruun Memorial Lecturers, starting this year with Dr Donald Anderson, Senior Scientist and Director of the Coastal Ocean Institute at the Woods Hole Oceanographic Institution.
- 18 The Executive Secretary reminded the Assembly of some important achievements of Anton Bruun as a Danish oceanographer and first Chairman of the Commission (1961). He participated in several international expeditions and was involved in the establishment of bodies like SCOR, IACOMS, IABO, and the IOC in his last decade. Mr Torben Wolff, Emeritus Prof. at the Zoological Museum of Copenhagen, speaking on behalf of Mr Erik Bruun, the son of Anton Bruun, expressed his thanks to the IOC for its initiative and for offering Anton Bruun's family the first IOC Anton Bruun Medal.
- 19 Dr Donald M. Anderson delivered the Bruun Memorial Lecture 2005 on "The ecology and oceanography of harmful algal blooms: multidisciplinary approaches to research and management". He explained that harmful algal blooms (HABs), commonly called "red tides", are increasingly common along the coasts of countries throughout the world. These phenomena are caused by the growth and aggregation of algae and other microorganisms, both microscopic (phytoplankton) and macroscopic (seaweeds), leading to negative impacts of many types. He reviewed the nature of the HAB problem, the trends in bloom incidence globally, possible causes of the apparent expansion in HAB incidence, and some of the new technologies and approaches that are being used for research and management.
- 20 The Bruun Memorial Lecture will be published in the IOC Technical Series.
- 21 Dr Laura Kong, Director of the International Tsunami Information Center (Hawaii, USA) delivered the N.K. Panikkar Memorial Lecture 2005 on a "People-centred tsunami warning system and the challenge of building preparedness at the national and local level". She explained how an effective tsunami early-warning system is achieved when all persons in vulnerable coastal communities are prepared for and respond appropriately and in a timely manner upon recognizing that a potentially destructive tsunami may be approaching. While timely tsunami warnings issued by an officially recognized regional tsunami warning centre using real-time seismic, sea-level, and other geophysical data streams from throughout the monitoring region, are an essential component of the system, it is absolutely critical that these scientifically based warning messages are communicated to the public in an understandable manner that clearly and simply instruct ordinary citizens on the actions they should take to ensure their safety. These actions include the evacuation of people in areas of potential flooding to safe zones or shelters, along with instructions on who should evacuate, where and how they should go, when to go, what to take, and how they will know when it will be safe to return. In this regard, pre-disaster tsunami awareness and preparedness are essential activities for educating and familiarizing the public in advance so that they are able to respond immediately and knowledgeably during the actual emergency. The success of any warning system lies in its ability to reach people; that is, the people with important specialized knowledge of the impending hazard are able to quickly and efficiently pass on actionable information to all the people who are at risk. Although technology is essential for information analysis and delivery, successful early-warning ultimately relies on the abilities of people to reach people.
- 22 The Panikkar Memorial Lecture will be published in the IOC Technical Series.

### 3. STATUTORY REPORTS

#### 3.1 STATEMENT OF THE CHAIRMAN ON THE STATE OF IOC

23 In fulfilment of his statutory obligations, the Chairman presented his report to the Assembly. He referred to recent developments in the work of the Commission and perspectives for the coming biennium, highlighting the impact of the Indian Ocean tsunami of 26th December 2004 on the work of IOC. He referred particularly to Science Programmes and to the WCRP, as well as to the GMA process. He also mentioned development of the Global Ocean Observing System and its potential involvement in the Global Earth Observation System of Systems (GEOSS). He recalled that, in September 2005, the IOC–WMO Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) will hold its second meeting in Halifax, Canada.

24 The Chairman commented on the implementation of IOC programmes in regions and its relation to the new IOC Principles and Strategy for Capacity-building, to be considered by the Assembly at the present session. He mentioned the important progress made by the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS) in formulating recommendations for the application of Article 247 of UNCLOS on marine scientific research projects undertaken by or under the auspices of international organizations.

25 He then informed the Assembly that the Officers of the IOC had been made aware of the proposals contained in the initial draft Programme and Budget (33 C/5) for 2006–2007 and had decided to call on all Member States to explore alternative funding strategies for IOC, under the guidance provided in a document prepared by the Vice-Chairman Javier Valladares (Argentina) responsible for Programme and Budget matters.

26 The Chairman stated the fact that IOC has ongoing achievements and programmes of which Member States can be justly proud. Nevertheless, much more can and needs to be done. However, unless additional resources are identified, even the existing activities are increasingly endangered.

27 He then referred to the Medium-term Strategy 2008–2013 and informed the Assembly that, following consultations at the meeting of the Chairpersons of the Major Subsidiary Bodies prior to the 37th Session of the Executive Council, he had presented a first draft of the Strategy to the Officers meeting in Tunisia, 3–5 February 2005. Although, formally, the Assembly should finally approve the Medium-term Strategy 2008–2013 at its 24th Session, in 2007, the Executive Council, at its 39th Session, should review and endorse a first draft in order to provide a timely IOC input to the review of the UNESCO Medium-term Strategy.

28 **The Assembly instructed** the Executive Secretary to prepare an IOC draft Medium-term Strategy 2008–2013 for the consideration of the Executive Council at its 39th Session and for final approval at the 24th Session of the Assembly.

#### 3.2 REPORT BY THE EXECUTIVE SECRETARY ON PROGRAMME AND BUDGET IMPLEMENTATION (2003–2005)

29 The Executive Secretary introduced this item. He addressed the key developments during the biennium 2004–2005 in the implementation of the approved programme and budget, as follows: the positive results of the Symposium on Quantitative Ecosystem Indicators for Fisheries Management (Paris, 31 March–3 April 2004); the high visibility achieved by the IOC in dealing with the issue of the increasing concentration of CO<sub>2</sub> in the upper layers of the ocean

at 'The Ocean in a High-CO<sub>2</sub> World' IOC-SCOR Symposium; the establishment of the Group on Earth Observation (GEO) and the Global Earth Observation System of Systems (GEOSS) and IOC's role in them; gradual recognition of the IOC as a GEF project executing agency; and the progress achieved in the preparation of the International Polar Year. He provided a detailed update on the leading role assumed by IOC in the coordinated and concerted activities of the UN to support the prompt development of tsunami early-warning capabilities in the Indian Ocean region. He gave a detailed explanation of the possible economic benefits of co-locating the tsunami detection networks and the climate observing systems, emphasizing the need to ensure maximum synergy and compatibility between such systems in order to optimize their utilization in a multi-hazard approach.

30 The Executive Secretary pointed out that, from 2004 onwards, the Annual Report contains the IOC Financial Statement certified by UNESCO's Chief Accountant. In this connection, at the request of the Executive Secretary, the Internal Oversight Service of UNESCO (IOS) carried out an audit to review the IOC Special Account and the effectiveness of controls in the major IOC administrative/operational procedures. The IOS concluded that: "...generally the internal controls in the IOC secretariat in Paris are functioning effectively and recommended measures to strengthen controls. Considering the effectiveness of the controls identified by the Audit, the IOS recommended increasing delegation of authority to IOC." He particularly referred to the most satisfactory level of cooperation achieved between IOC and the UNESCO central financial services, notably the Office of the Comptroller, the Bureau of the Budget and the Internal Oversight Service (IOS).

31 Mr John Parsons, the Head of the Internal Oversight Service, briefly addressed the Assembly confirming the globally positive outcome of the IOC audit and praising the highly responsive and responsible attitude of the IOC Secretariat to the implementation of the Audit's recommendations.

32 Regarding strategic matters impacting the future development of the IOC, the Executive Secretary briefly reported on the growing gap between the tasks assumed by the Commission and the resources available for fulfilling them. This gap has become critical in the face of the responsibilities that the international community is requesting of the Commission in the aftermath of the Indian Ocean tsunami catastrophe of 26 December 2004. IOC Officers, at their last meeting (Tunisia, 3–5 February 2005), decided that Member States need to discuss the funding mechanisms available to the Commission in depth and prepared a document proposing some new alternatives, (document IOC-XXIII/2 Annex 8, "We have a Problem") tabled for consideration under Agenda item 5.1.

33 The Chairman urged Member States to take active part in the work of the open-ended Programme and Budget Committee and invited the Chairman of this Committee, Captain Javier Valladares, to report to the Assembly on the Committee's review of the Executive Secretary's report on Budget Implementation.

34 **The Assembly expressed** its appreciation of the high standard of reporting achieved by the Secretariat both on programme and financial matters. In the ensuing discussion, several Member States encouraged the Programme and Budget Committee to address the budget and personnel shortages by considering a wide range of options, including the possibility of alternative funding to ensure basic funding for the Commission's activities, as foreseen under Article 10 of the statutes. A number of pertinent programme-related comments were made, notably with regard to further tsunami warning system development and the need for the Secretariat to develop a plan for IOC's participation in the scientific activities of the International Polar Year, as instructed by Resolution EC-XXXVII.3.

35 **The Assembly**, noting that the success of the IPY depends to a large extent on a substantial contribution by the participating countries, **urged** Member States concerned to participate actively in the implementation of the IPY Core Projects related to polar oceanography. **It requested** the Executive Secretary to develop a plan for IOC's participation in IPY scientific initiatives pursuant to Resolution EC-XXXVII.3. **The Assembly requested** the Intergovernmental Committee for GOOS to consider the establishment of GOOS Regional Alliances for the polar regions to provide appropriate foci for planning, and to support the development and long-term maintenance of ocean-observing systems in polar regions. **The Assembly requested** the Executive Council to review the state of preparation for the IPY, at its 39th Session.

36 The Representative of WMO emphasized the importance of establishing GOOS Regional Alliances in the Arctic and the Antarctic that would provide foci for planning and supporting the development and long-term maintenance of ocean-observing systems, through the IPY and beyond.

37 The Secretariat took careful note of these comments and recommendations.

### 3.3 PRESENTATION BY THE EXECUTIVE SECRETARY OF THE DRAFT PROGRAMME AND BUDGET FOR THE BIENNIUM 2006–2007

38 The Executive Secretary introduced this item. He referred to the Zero Nominal Growth (ZNG) budget ceiling approved as a guideline for finalizing the Draft 33 C/5 at the 170th Executive Board of UNESCO. He informed the Assembly that the Executive Board did not mark IOC as a principal priority. As a consequence, the IOC envelope for planning 2006–2007 was reduced by about US\$900,000 from 4,721,600 to 3,821,600 US dollars. The Executive Secretary explained that the net impact on programme support would be a reduction of 20%, since a reduction in staff costs was not considered to be an option, given the already understaffed situation of the Commission. The budgetary reduction led the Executive Secretary to propose a reduction in the number of the MLAs integrated into the Draft 33 C/5, concentrating the programme from five to only three of the MLAs initially adopted by the 37th Executive Council: Science, Operational Services, and Capacity-building, cutting significantly into the support for policy and regional activities. He reported to the Assembly that a specific reinforcement, of one additional professional staff post was included in the Draft Programme and Budget. An additional reinforcement of the Tsunami Programme is included in the Draft 33 C/5, for an amount of US\$1,000,000, as part of a special voluntary fund presented by UNESCO's Director-General above the US\$610,000,000 adopted ceiling.

39 The suggestions made by several Member States aimed at improving the IOC financial situation ranged from enhancing interdisciplinary cooperation within UNESCO (notably with IHP, which currently benefits from a priority status within the Science Sector and UNESCO as a whole, and the Education Sector with regard to capacity-building) to the elaboration of a coherent and cohesive 'business plan', both in relation to the 'core' programme structure and to extra-budgetary fund-raising. The creation of a 'fund-raising committee' was suggested.

40 Several Member States (China, Italy, Mexico, Russian Federation and Venezuela) spoke in support of the Ocean Mapping Programme, suggesting that the Secretariat should continue its efforts in looking into all possible alternative solutions for preserving this programme. The representative of the International Hydrographic Organization echoed this position.

41 The Russian Federation requested the Executive Secretary to go ahead with secretariat support to the Ocean Mapping Programme, including extra-budgetary support. The Delegate

stated that, since his proposals had been taken into account in the draft Programme and Budget 2006–2007, he would withdraw his Draft Resolution on the conservation of the Ocean Mapping Programme among the ongoing programmes of IOC, on the understanding that this condition be reflected in the Summary Report of the present session of the Assembly.

42 The Executive Secretary expressed his support of the Member States' recommendations to elaborate a realistic 'business plan' in order to secure the core programme structure, ensure proper prioritization and review the IOC fund-raising strategy. He shared the concern expressed on the future of the Ocean Mapping Programme and informed the Assembly that this programme may find a new perspective in the context of the development of tsunami warning systems and of GEOSS.

43 The Chairman invited the Programme and Budget Committee, chaired by Captain Javier Valladares, to report to the Assembly on the Committee's consideration of the IOC Draft Programme and Budget for the biennium 2006–2007 (Draft 33 C/5) taking due account of comments expressed by Member States in Plenary.

44 The Chairman reminded the Assembly that the Resolution dealing with Programme and Budget 2006–2007 should delegate to the Executive Council, at its 39th Session, the approval of the MLAs for the biennium 2008–2009.

45 **The Assembly thanked** the Executive Secretary for his clear and detailed report.

#### 3.4 REPORT ON ACTIVITIES OF THE IOC (2003–2004) FOR PRESENTATION TO THE 33RD GENERAL CONFERENCE OF UNESCO

46 The Executive Secretary introduced this item. He recalled that the 30th Session of the General Conference of UNESCO, in 1999, approved a modification of the Statutes of the Commission and confirmed the functional autonomy of IOC and the requirement to report directly to the General Conference.

47 He informed the Assembly that the Report of the External Auditor [document 165 EX/29 Add., Financial report and audited financial statements of UNESCO for the period ended 31 December 2001] recommends that UNESCO, IHP and IOC "*should tailor their performance information reports to their different governing bodies, reflecting the different roles of the General Conference (...) and the IOC Assembly.*" Following this recommendation, the preceding biennial report (for 2000–2001) highlighted achievements of IOC with respect to the main results expected in the UNESCO Medium-term Strategy 2002–2007 (31 C/4). While this approach is maintained in the present version of the biennial report submitted by the Executive Secretary, a short section is included to report, by each Main Line of Action (C/5 format), on the results obtained.

48 **The Assembly approved** the Biennial Report by the IOC on its Activities (2003–2004), for submission to the 33rd UNESCO General Conference.



#### 4. PROGRAMME MATTERS REQUIRING DECISIONS BY THE ASSEMBLY

##### 4.1 GENERAL POLICY ISSUES

##### 4.1.1 The Global Earth Observation System of Systems (GEOSS) and its 10-year Implementation Plan: Report of the Executive Secretary on the Expected Role of the IOC through Its Programmes

49 The Executive Secretary introduced this item. He noted that since the first Earth Observation Summit (EOS-I, Washington, D.C., 30 July–2 August 2003), several actions had been taken to develop a comprehensive, coordinated and sustained Global Earth Observation System of Systems (GEOSS). The EOS-I and the Second Earth Observation Summit (EOS-II, Tokyo, 25 April 2004) led the *ad hoc* intergovernmental Group on Earth Observations (GEO) to develop a comprehensive, coordinated and sustained Global Earth Observation System of Systems (GEOSS) based on existing observing systems, to enable governments and the international community to understand and address global environmental and economic challenges. This initiative was regarded as an exceptional opportunity to define, at a high political level, firm resources for operational observation of the Earth.

50 The Executive Secretary drew the attention of the Assembly to the development of the GEOSS 10-Year Implementation Plan based on the Framework Document adopted at the EOS-II, describing the fundamental elements of an Earth Observation System and its principal expected benefits to a broad range of user communities. The Third Earth Observation Summit (EOS-III, Brussels, 16 February 2005) endorsed this 10-Year Implementation Plan. The participants in the EOS-III also resolved to meet again before the end of 2007, to take stock of progress, provide further guidance for the successful implementation of GEOSS, and conduct a mid-term assessment of GEO by 2010.

51 The Executive Secretary reported on the establishment of the Intergovernmental Group on Earth Observations (GEO, to replace the *ad hoc* Group) at EOS III, to take steps necessary to implement GEOSS in accordance with its Implementation Plan. The GEO Secretariat, at the invitation of the WMO and with the support of the Swiss Government, was set up at the WMO Headquarters in Geneva. The GEO also encouraged the governments and the governing bodies of the UN Specialized Agencies and Programmes to endorse the implementation of GEOSS and to encourage and assist GEO in its work.

52 The Executive Secretary noted the significant contribution by IOC to the GEO/GEOSS process. Since the initiation of the GEOSS 10-Year Implementation Plan, the IOC had actively participated and provided technical expertise, in cooperation with the scientific community, in view of the value of existing observing systems, such as GOOS, as key components of GEOSS. As a result of continuous efforts, the GOOS was recognized in sixteen Work Packets in the GEOSS 10-Year Implementation Plan, under various societal benefit areas in GEOSS —climate, ecosystem and biodiversity— and coordinated efforts had been made to provide expertise to short-term and long-term plans for GEOSS implementation. The Assembly was reminded of Resolution EC-XXXVII.2, which endorsed the concept of GEOSS and supported its implementation to the maximum extent possible within the IOC mandate.

53 Regarding the tsunami catastrophe of 26 December 2004 in the Indian Ocean, the Executive Secretary informed the Assembly that the EOS-III, after listening to a report, by the IOC Executive Secretary, on the plans to implement an Indian Ocean Tsunami Warning and Mitigation System (IOTWS), issued a communiqué stressing that disaster-reduction is one of the high priorities of the GEOSS 10-Year Implementation Plan. The communiqué also requested the

GEO to support the coordinating activities of the IOC and related national and regional initiatives to develop effective tsunami warning systems in the Indian Ocean and other regions of the world, in a multi-hazard approach supported by GEOSS. For the follow-up of this, the GEO Executive Committee established a working group on tsunami in support of the development of IOTWS to which IOC, as a participating agency in GEO, was invited to become a member.

54           **The Assembly welcomed** the successful establishment of GEO **and particularly welcomed** the communiqué on support for tsunami and multi-hazard warning systems adopted at the EOS-III, as well as the follow-up actions of GEO.

55           **The Assembly endorsed** the concept of GEOSS **and supported** its 10-year Implementation Plan.

56           **The Assembly noted** with appreciation the contributions made by IOC to the overall GEO process, especially the emphasis put on the value of existing observing systems, including GOOS, and on the Executive Secretary's report to GEO on IOTWS. It agreed that the IOC should remain involved in the GEOSS development, not only in respect of its Work Plan but also in the activities of various working groups, such as the Tsunami Working Group and User Interface Working Group.

57           **The Assembly considered** that the IOC should find appropriate ways to coordinate with GEO on support for the tsunami warning system. **It stressed** that IOC programmes and activities could be assessed in the light of the societal benefits addressed in the GEOSS 10-Year Implementation Plan.

58           **The Assembly emphasized** that the GEO should be kept fully informed of the needs of the programmes and bodies of IOC, including GOOS, as an essential component of GEOSS, JCOMM, IODE, ICAM, Ocean Mapping and Capacity-building.

59           **The Assembly urged** the Member States to actively participate in the GEO national coordination.

60           **The Assembly adopted** Resolution XXIII-1.

#### **4.1.2 Mauritius International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (Barbados+10): Report of the Executive Secretary**

61           The Technical Secretary, Mr Julian Barbière, introduced this item. He referred to the Mauritius Declaration of the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of SIDS (A/CONF.207/L.6), as well as the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of SIDS (A/CONF.207/CRP.7) which were both adopted at the Mauritius International Meeting (MIM) held in Port-Louis, Mauritius, 10–14 January 2005.

62           The outcomes of the meeting, in particular the Mauritius Strategy, reaffirmed that the Barbados Programme of Action remains the blueprint for SIDS and the international community to address national and regional sustainable development in SIDS. With regard to areas relevant to the IOC mandate, the following calls were made, particularly in section IV of the Mauritius Strategy on Coastal and Marine Resources:

- SIDS should be assisted to complete the maritime delimitation of their continental shelf under the UNCLOS provisions;

- regional monitoring of the marine environment and the Global Ocean Observing System should be promoted in SIDS;
- SIDS should support IOC marine science programmes that are of particular relevance to small island developing States;
- activities to address the impact of coral bleaching, including enhancing the resistance and recovery of coral reefs, should be developed in SIDS countries.

63 He informed the Assembly that the IOC's response is being organized as part of the overall UNESCO Strategy for SIDS. The IOC "SIDS Declaration" adopted by the IOC Executive Council (June 2004), which was distributed and presented at the MIM, defines the IOC strategy in responding to the SIDS agenda. In particular, the following actions are to be undertaken: the development of GOOS Regional Alliances in SIDS regions (IOCARIBE-GOOS, Pacific-GOOS, Indian Ocean GOOS); the development of Integrated Coastal and Ocean Management Projects in SIDS regions (Cape Verde, Caribbean), including a GEF LME Project in the Caribbean; the IOC contribution and support to the Global Forum on Oceans, Coasts and Islands; and the IOC leadership role in the Global Coral Reef Monitoring Network and the GEF Coral Reef Research and Capacity-building project.

64 Ambassador Koonjul, Mauritius Representative to the UN and Chair of the Alliance of Small Island States (AOSIS) further reported on the follow-up to the Mauritius International Meeting. He expressed his gratitude to IOC and UNESCO for their contributions to the preparations and final outcomes of the MIM. Many of these contributions have been reflected in the Mauritius Strategy. AOSIS supports the need to improve our scientific knowledge in understanding and forecasting ocean processes, as a basis for developing sustainable national and regional ocean policies. He also welcomed the concept of Integrated Coastal Area Management (ICAM) and called on IOC to assist in its implementation in the specific context of SIDS. He stressed that AOSIS supports the proposal to strengthen capacity-building for ocean management and called on IOC to assist in building institutional capacity in SIDS countries which very often do not have national inter-sectoral mechanisms for ocean affairs.

65 He highlighted the issues of coral-reef protection and climate change as two major issues requiring urgent action at the international level.

66 Finally, Ambassador Koonjul called on IOC to remain engaged in the UN SIDS inter-agency task force in order to maintain close cooperation and above all to continue consultation with SIDS and their regional organizations. He welcomed IOC's involvement in the Global Forum on Oceans, Coasts and Islands, and particularly the development of SIDS regional reports on ocean capacity-building to be developed in conjunction with, and as a contribution to, the planned AOSIS regional meetings on MIM implementation.

67 Australia expressed its interest in assisting SIDS in developing maritime-hazard-mitigation programmes and urged SIDS to increase their participation in IOC programmes. In this respect, Australia is writing to Ministries of SIDS countries in the Pacific region to encourage their active involvement in the Commission.

68 Canada welcomed the follow-up provided by IOC to the SIDS agenda, and congratulated IOCARIBE for improving the participation of SIDS in its regional programmes. Canada called on IOC to reach out to the political levels in SIDS, the timing being appropriate in light of the visibility of IOC through its mandate in the tsunami warning system coordination. Canada urged IOC to ensure that a call for increased participation of SIDS in IOC programmes be made

through the UN Secretary-General's Report to the UN in the section relevant to SIDS implementation.

69 SOPAC informed the Assembly that it took an active part in the Mauritius International Meeting, as well as in the Kobe Conference on Natural Disasters, through the provision of technical support to SIDS from the Pacific Region. SOPAC is maintaining a high level of cooperation with IOC, particularly through IODE and the IOC Regional Programme Office in Perth, and participates actively in the Pacific Islands GOOS (PI-GOOS). It is hosting a full-time PI-GOOS coordinator in Suva, Fiji, at its Secretariat.

70 **The Assembly welcomed** the Executive Secretary's report on the SIDS International Meeting and its follow-up.

71 **The Assembly urged** SIDS to strengthen their participation in IOC's programmes, as called upon in the Mauritius Strategy.

#### 4.1.3 Prioritized Follow-up of Key Recommendations of the External Evaluation

72 The Executive Secretary introduced this item. He recalled that, since the publication of the External Evaluation Report in 2000 (IOC/EC-XXXIII/2 Annex 3), the Assembly and the Executive Council have requested the Executive Secretary to report regularly on follow-up actions and implementation (Documents 2001/IOC-XXI/2 Annex 3, 2002/IOC/EC-XXXV/2 Annex 3, 2003/IOC-XXII/2 Annex 8, 2004/IOC/EC-XXXVII/2 Annex 3). At its 35th Session, the Executive Council decided moreover that the follow-up of actions should be prioritized. Following the guidance of the Executive Council, the follow-up has referred only to pending key recommendations. The most salient issue pending was the establishment of the UN-Oceans network which is now in place and is taken up under Agenda item 4.6.4.

73 China highlighted the fact that some issues may still need follow-up and suggested a post-evaluation study to be prepared by the Secretariat to evaluate the results achieved in the last six years compared to the original recommendations.

74 **The Assembly decided** to discontinue the follow-up of the key recommendations of the External Evaluation as instructed in previous IOC governing-body meetings **and accepted** the proposal of China.

75 **The Assembly instructed** the Executive Secretary to conduct a post-evaluation study to evaluate the results achieved in the last six years relative to the original recommendations and to report to the Officers Meeting in January 2006, and, if appropriate, submit the results of this assessment to the Executive Council at its 39th Session.

## 4.2 OCEAN SCIENCES SECTION

### 4.2.1 IOC Ocean Sciences Section Overview

76 The Head of the IOC Ocean Sciences Section, Dr Ümit Ünlüata, introduced this item. He provided a brief report on the work of the Ocean Sciences Section, the expected results during the present mid-term strategy period and the results achieved in 2004. An Advisory Group of Ocean Scientists was constituted to provide guidance to the IOC's Ocean Sciences Section.

77 Some Members States expressed the view that the programme of the Ocean Sciences Section needs to be fully integrated. There is a need to consider the inclusion of programmes on fisheries, including aquaculture, management and effects of fisheries on the marine environment.

The deep-sea environments are also not well covered. The Section could address, *inter alia*, matters related to: ocean-based renewable energy sources; indicators of the health of the environment beyond coral reefs and benthic communities. It was suggested that an internet-based discussion could take place on these and other points of interest.

78 The Chairman suggested that, initially, these issues would be best considered and discussed by the newly formed Advisory Group in consultation with the Member States. The Section should ensure that this is done as soon as possible.

#### 4.2.2 Sponsorship of the World Climate Research Programme

79 The Director of the World Climate Research Programme (WCRP), Dr David Carson, introduced this item. IOC has been a sponsor of the WCRP since it signed the Memorandum of Understanding with WMO and ICSU in 1993. The major current project of the WCRP addressing the oceans is the Climate Variability and Predictability Project (CLIVAR), the natural successor to the World Ocean Circulation Experiment (WOCE). Other WCRP activities that contribute to the achievement of IOC goals include the Climate and Cryosphere Project (CliC), the IGBP and SCOR co-sponsored SOLAS Project, support of observations, data assimilation and model development, the Global Carbon Project, and WCRP involvement with the IPCC, IPY, and GEO. He highlighted the joint implementation by the IOC and WCRP of a number of activities, such as the OOPC, the CLIVAR–IOC Indian Ocean Panel, and IOCCP–CLIVAR carbon hydrography activities. Dr Carson recalled that the WCRP was governed by the IOC–WMO–ICSU Joint Scientific Committee and, in 1993, was expanded to include six oceanographers in its 18 members.

80 Dr Carson presented the current projected budget of the WCRP for 2006–2007, noting that the IOC-proposed annual contribution of US\$125,000 would represent 6% of the WCRP budget, with ICSU contributing 14% and WMO 74%. He welcomed the suggested contribution from the IOC, but noted this represented a reduction from the amount expected from the IOC when the WCRP budget for 2004–2007 was established by the WMO Congress in 2003. He asked the Assembly to resolve not only contributions for 2006–2007, but for the current year as well. He noted that the arguments that led to the IOC's joining the WMO and ICSU as a full and equal sponsor of the WCRP were persuasive in 1992, and remain even more so today, as the crucial role of the global oceans in the climate system becomes clearer. WCRP strongly supports the IOC's objective of developing practical tools and products, underpinned by internationally collaborative research.

81 **The Assembly thanked** Dr Carson for his presentation, **and noted** the importance of the work of the WCRP to the achievement of IOC's objectives.

82 Some Member States expressed concern over the small Regular Programme contribution proposed in the 2006–2007 budget to support the WCRP, emphasizing that a stable commitment cannot be achieved through a mechanism that requires over half of the IOC commitment to be contingent upon unreliable extra-budgetary funds. Some Member States also expressed concern that the IOC community has not been as engaged as it should be in the WCRP, and that the IOC must play the leading role of ensuring that ocean research is thoroughly integrated into WCRP programmes.

83 Several Member States suggested that there should be a broader assessment of the overall priorities of the IOC Ocean Science Section, with a view to identifying resources for the programme.

84           **The Assembly commended** the WCRP for its effort in coordinating global climate research.

85           **The Assembly reaffirmed** its continued co-sponsorship and its support of the WCRP. **The Assembly instructed** the Executive Secretary to find ways to support the WCRP at a proposed level of at least US\$125,000 per year through Regular Programme funds. **The Assembly urged** all Member States to redouble their efforts to contribute to the IOC Special Trust Fund for the WCRP.

#### **4.2.3 Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms**

86           The Chairwoman of the IOC Intergovernmental Panel on Harmful Algal Blooms (IPHAB), Dr Beatriz Reguera (Spain), introduced this item. She recalled that, as a primary subsidiary body of the Commission, the Panel is required to report to the Assembly (or Executive Council) on its sessions.

87           The 7th Session of IPHAB (UNESCO, Paris, 16–18 March 2005) focused on: further strengthening the capacity-building aspects of the programme; assisting the IOC–SCOR Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB) Programme in its implementation phase; initiatives to overcome international incompatibilities in biotoxin regulation; ensuring the consolidation and further development of IOC/HAB data bases; and the further development of the regional components of the programme.

88           The Panel recommended (Recommendation IPHAB-VII.1) that the IOC Member States actively assist in the identification and provision of the necessary and sustained support for the IOC–SCOR International Programme Office for GEOHAB, following a model in which contributions are pooled, as is being done successfully by programmes such as InterRidge and IMAGES.

89           The Panel recognized the possible effects of climatic trends and oscillations, as well as of exceptional events, on the spatial and temporal occurrence of ciguatera fish poisoning (CFP), and that the tsunami disaster on 26 December 2004 significantly impacted the coastal environment of several countries (e.g. India, Indonesia, Sri Lanka and Thailand) bordering the Andaman Sea. CFP events have occurred after such devastation of the coastal environment, because decaying corals provide opportunities for the proliferation of seaweeds, on which toxic benthic microalgae responsible for CFP grow. Through Recommendation IPHAB-VII.2, the Panel urged the Assembly to take these aspects fully into account in IOC follow-up of the tsunami catastrophe of 26 December 2004 in the Indian Ocean.

90           The Strategic Design Plan for the Coastal Ocean Observations Module of the Global Ocean Observing System (GOOS) has, as one of its goals, the reduction of public-health risks and the restoration and protection of living marine resources, and operational observation of harmful algal blooms (HABs) as an important constituent. Through Recommendation IPHAB-VII.3, the Panel reaffirmed its preparedness to cooperate with the GOOS Scientific Steering Committee (GSSC) to define effective systems for monitoring harmful algal species at the appropriate functional level, which would allow detection of detrimental changes in marine systems, with a view to better understanding and managing coastal ecosystems.

91           The Panel expressed (Recommendation IPHAB-VII.4) its continued focus on the transfer of marine organisms by ballast of ships and other vectors and recommended that the ICES–IOC–IMO Working Group on Ballast of Ships and other Vectors continue in 2006–2007 under the joint auspices of ICES, IOC and IMO. The Panel urged IOC Member States to support activities

to assess the effectiveness of the International Convention for the Control and Management of Ship Ballast Water and Sediments in preventing the introduction of exotic aquatic organisms via ballast water.

92 The Chairwoman of the IPHAB informed the Assembly of the work of the IPHAB Task Team on Biotoxins in assisting the FAO–WHO Codex Committee on Fish and Fisheries Products (CCFFP). The Task Team was absorbed into the Joint FAO–IOC–WHO *ad hoc* Expert Consultation on Biotoxins in Bivalve Molluscs, with the objective of recommending revision of the CCFFP Standard and Code of Practice for Live Bivalve Molluscs. The Panel restated its concern, however, on the limited coordination and potential incompatibility of regulations on the contamination of seafood by phycotoxins and the associated impediment to trade in seafood products.

93 The Chairwoman of IPHAB urged the IOC Member States to carefully match the HAB Programme Work Plan with national priorities and potential funding in order to interact effectively with it and support its implementation.

94 Several Member States stressed that HABs are a persistent problem with broad societal implications and that capacity-building therefore remains a high priority.

95 Denmark reconfirmed its interest in continuing the close partnership and urged other Member States to provide complementary funding to ensure the continuity of the Programme.

96 India offered to host regional training activities at the National Institute of Oceanography, Goa.

97 The Representative of SCOR expressed SCOR's appreciation of the cooperation with IOC on GEOHAB and, while recognizing the financial difficulties the IOC is facing, also noted that any inability of the IOC to keep its commitment to the operation of the GEOHAB SSC would have a major adverse impact on GEOHAB.

98 **The Assembly expressed** its appreciation of results achieved and the progress made.

99 **The Assembly acknowledged**, with thanks, the crucial role of the stable and significant support provided by the Governments of Denmark and Spain and the institutions hosting the IOC Science and Communication Centres: the University of Copenhagen, in Copenhagen, and the Spanish Institute of Oceanography, in Vigo.

100 **The Assembly welcomed:** the reconfirmation by Spain of its commitment to renew the cooperation agreement after the present agreement ends in 2006; the USA's indication that it will double its contribution to GEOHAB; the support of Japan for regional HAB activities in the western Pacific; and the resources provided by Germany through the partnership of three German institutions in the IOC Science and Communication Centre.

101 **The Assembly expressed** strong concern on how the proposed reductions in the Regular Programme Budget would affect the HAB Programme and in particular how the existing and planned regional activities would be impacted. A proportional distribution of the budget reductions was suggested by Chile as a way to avoid a larger reduction for the HAB Programme than for other IOC activities.

102 **The Assembly adopted** Resolution XXIII-2.

#### 4.2.4 Terms of Reference and Status of the SCOR–IOC Advisory Panel on Ocean Carbon Dioxide

103 Dr Maria Hood, IOC programme specialist and technical secretary for the “CO<sub>2</sub> Panel”, introduced this item. At the 2002 meeting of the IOC–SCOR Advisory Panel on Ocean CO<sub>2</sub> (“the CO<sub>2</sub> Panel”), it became clear that, while the CO<sub>2</sub> Panel was an effective mechanism for identifying areas requiring closer collaboration in ocean carbon observations, there was a need for a group to implement the necessary actions at the international level. In response to this need, the CO<sub>2</sub> Panel, in partnership with the Global Carbon Project, developed a pilot project in 2003, International Ocean Carbon Coordination Project (IOCCP), to implement targeted, time-bound coordination activities for the ocean-carbon community.

104 In its first two years of operation, the IOCCP has been successful at meeting the needs of the community, working directly with over 100 scientists from 17 countries, and attracting external financial support from national agencies and programmes to implement its activities. Several global, regional, and national research programmes have now asked the IOCCP to expand its programme to provide coordination services for research programmes as well as for observational activities.

105 To meet this request without developing a new IOC programme and keeping the financial implications at existing levels, it is proposed to replace the Terms of Reference of the present SCOR–IOC Advisory Panel on Ocean Carbon Dioxide by those of the newly expanded IOCCP, given in Information Document IOC/INF-1208 and to rename the Panel the International Ocean Carbon Coordination Project.

106 **The Assembly thanked** Dr Hood for her presentation **and expressed** its support for the expanded mandate to include coordination focused on the full ocean-carbon cycle, as well as on the related research, and coastal carbon activities.

107 Several Member States expressed interest in participating in IOCCP coordination work through their on-going national and regional programmes.

108 Venezuela informed the Assembly that the CARIACO Project provides real-time information and offers possibilities for carbon-cycle research in an epicontinental tropical sea.

109 **The Assembly endorsed** the Terms of Reference for the International Ocean Carbon Coordination Project as given in Annex VI of the present Summary Report.

#### 4.2.5 The Census of Marine Life

110 The Senior Scientist for the Census of Marine Life (CoML) at the Consortium for Oceanographic Research and Education, Dr Ron O’Dor, introduced this item.

111 CoML is a growing global network of researchers in more than 70 countries engaged in a 10-year initiative to assess and explain the diversity, distribution, and abundance of life in the ocean and how it changes over time. The findings will help identify threatened species and important breeding areas, thus helping authorities to develop effective strategies for the sustainable management and rational exploitation of living marine resources.

112 Some Member States stressed the potential and highly relevant links between OBIS, IODE and GOOS, since such linkage may become a main constituent of the proposed Global Marine Assessment. Also, the link between OBIS and IODE will help ensure the sustainability of OBIS.



113 Other Member States emphasized the value of CoML as a source of scientific knowledge of relevance to a better definition of large marine ecosystems in ecological regions.

114 A significant number of Member States referred to their active involvement in and contribution to CoML and OBIS.

115 **The Assembly fully recognized** the importance and relevance of CoML **and endorsed** the proposal to formally link relevant IOC Programmes to CoML.

116 **The Assembly adopted** Resolution XXIII-3.

#### 4.3 OCEAN SERVICES SECTION

##### **4.3.1 Progress Report on the Strategic Plan for Oceanographic Data and Information Management**

117 The Chairwoman of the Committee on International Oceanographic Data and Information Exchange (IODE), Dr Lesley Rickards, introduced this item. She recalled that the First Session of the JCOMM Management Committee had recommended the development of an IOC integrated data-management strategy, encompassing all programmes. IOC had adopted Resolution EC-XXXV.2 entitled “IOC Strategic Plan for Oceanographic Data and Information Management”, by which it established a Task Team on the Development of an IOC Strategic Plan for Oceanographic Data and Information Management. The Task Team, at its First Session (UNESCO, Paris, 23 June 2003), drafted a statement on vision, rationale, principles/objectives and elements of governance for the IOC Strategic Plan for Oceanographic Data and Information Management (document IOC/INF-1191). The Task Team was unable to meet again, since most of its Members had taken on other national responsibilities.

118 During IODE-XVIII (Ostend, Belgium, 26–30 April 2005), a Sessional Working Group addressed the issue, also taking into consideration the IODE Review Report (see agenda item 4.3.2). The Group prepared an outline of the required strategy document. IODE-XVIII recommended: tasking a dedicated, knowledgeable individual to draft the Strategy; that the consultant be identified by the end of August 2005; that a progress report be prepared for the consideration of the IOC Executive Council, at its 39th Session, in 2006; and that the Draft Report be submitted to IODE-XIX and/or the IOC Assembly in 2007.

119 **The Assembly endorsed** the proposed work plan for the development of the IOC Strategic Plan for Oceanographic Data and Information Management **and requested** the Chairwoman of IODE, in collaboration with the Executive Secretary, to make the necessary arrangements.

##### **4.3.2 Eighteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE)**

120 The Chairwoman of the IOC Committee on International Oceanographic Data and Information Exchange (IODE), Dr Lesley Rickards, introduced this item. The IOC Committee on International Oceanographic Data and Information Exchange held its 18th Session (IODE-XVIII) in Ostend, Belgium, 26–30 April 2005. IODE covers a very wide range of activities. Underpinning these activities are the IODE data centres (NODCs) which handle a wide range of data types (e.g. physical, chemical, biological, geological/geophysical). Thirty per cent of them are handling data in real time, and many are dealing with data relevant to GOOS and/or major science programmes.

- 121 Good progress has been made in the development of a Marine XML and of a prototype 'end-to-end data-management' system through the joint IODE–JCOMM ETDMP. Development of global data bases is continuing in a number of projects, notably the Global Ocean Surface Underway Data (GOSUD) pilot project.
- 122 With regard to capacity-building, Dr Rickards reported significant successes with the continuing development of Ocean Data and Information Networks (ODINs), in particular ODINAFRICA, now in its third phase, but also of ODINCARSA and the newly established ODINCINDIO. She also noted the discussions at WESTPAC-VI which considered the development of an ODIN-WESTPAC. An associated activity is the development of ODIMeX — upgrading the existing OceanTeacher training package to include operational oceanography, biological data, remote sensing, GIS, etc.
- 123 IODE cooperates with many other projects and programmes. She referred in particular to the collaboration developed between the Regional OBIS Nodes and IODE's NODCs, and to the emerging links between JCADM's National Antarctic Data Centres and these NODCs.
- 124 The IOC Project Office for IODE was opened on 25 April 2005, immediately prior to IODE-XVIII, and Dr Rickards expressed IODE's thanks to the Government of Flanders and the city of Ostend (Belgium) for generously providing this facility. She informed the Assembly that ten training courses and related activities have already been planned for the remainder of 2005, including a joint JCOMM–IODE–GOOS training course on numerical modelling and data management.
- 125 The IODE Review was completed by a Review Team led by Mr Dieter Kohnke. The Review Team made 17 recommendations which IODE discussed in detail at its 18th Session. On the basis of the Review, IODE-XVIII decided and recommended several fundamental and structural changes, including redefining its objectives and streamlining its operations by re-composition of the IODE Officers, abolition of the RNODC and IODE Regional Coordinator systems, and by further reviewing the work of the IODE Groups of Experts during the next intersessional period.
- 126 The IODE Programme is currently staffed by only one permanent position. The position of the Head of the IOC Project Office for IODE (who coordinates most of the IODE capacity-building activities and technical projects) is a temporary position and its funding in the future is uncertain. In addition, the IODE budget from UNESCO's Regular Programme has been reduced to a level that will not allow it to sustain the development of the IODE Programme. Dr Rickards encouraged Member States to assist IODE through the provision of extra-budgetary funds and secondment of experts to the IOC Secretariat and/or the IOC Project Office for IODE. She expressed her appreciation to the United States NODC for making available Mr Robert Gelfeld to the IOC Secretariat for six months in 2005 and urged other Member States to follow this example. Dr Rickards also thanked the Government of Flanders for providing an additional €500,000/year to the IOC Project Office for IODE, which will assist in implementing the comprehensive regional capacity-building programme of IODE, and for its continuing support of ODINAFRICA, ODIMeX and the African e-repository projects.
- 127 France informed the Assembly that the IMDIS (International Marine Data and Information Systems) Conference (Brest, France, 31 May–3 June 2005) had been very successful.
- 128 **The Assembly expressed** its appreciation to the Chairwoman of IODE for her excellent leadership.

- 129        **The Assembly warmly welcomed** the opening of the IOC Project Office for IODE, noting that this facility will be a meeting venue, training centre and a communications hub, and will serve as a forum and creative environment for developing IODE and partnership projects, programmes and organizations. **The Assembly invited** other organizations and programmes to make use of this new facility and to establish joint activities with IOC and its IODE.
- 130        **The Assembly thanked** the Government of Flanders for its generous and continuing support to IODE through its hosting of the IOC Project Office for IODE, and its continuing and expanding financial support of IODE's capacity-building activities.
- 131        **It also thanked** the United States of America for providing temporary professional staff assistance to the IOC/IODE Secretariat in 2005.
- 132        **The Assembly called on** Member States to reinforce IODE by providing seconded staff to the IOC Secretariat and/or IOC Project Office for IODE for short, medium or long periods.
- 133        **The Assembly noted** with appreciation the continuing success of the ODINAFRICA and ODINCARSA Projects, and welcomed the development of the ODINCINDIO Project.
- 134        **The Assembly also welcomed** the fact that the ODIN projects are being developed to serve all ocean science and observation programmes of IOC at the regional level through relevant capacity-building, as well as development of products and services.
- 135        **The Assembly noted** with appreciation that ODIN projects were starting to play a catalytic role in starting up new alliances between NODCs and science or observation programmes with a variety of other projects, programmes and organizations, **and requested** Member States with positive experience in this regard to share it with all Member States.
- 136        **The Assembly noted** the development, in some Member States, of distributed national data-management facilities **and invited** Member States to consider such an option for their national oceanographic data and information-management systems as a way to maximize the use of the NODC expertise for the benefit of all national partners in ocean science and observation.
- 137        **The Assembly approved** the IODE review **and acknowledged** the positive reception and adoption by IODE-XVIII of many of the Review's recommendations, which should result in a more streamlined, effective and reinvigorated IODE.
- 138        **The Assembly stressed** the importance of IODE as a core IOC programme that is of crucial importance to all IOC programmes. **The Assembly instructed** the IODE Chairwoman and IOC Executive Secretary to discuss with the GEO Secretariat ways and means of establishing close collaboration to ensure that GEOSS can benefit from the extensive expertise and experience of the IODE Programme and IODE data centres.
- 139        **The Assembly reaffirmed** the importance of cooperation between IODE and JCOMM in the development of an integrated data-management strategy.
- 140        **The Assembly endorsed** the Executive Summary of the 18th Session of IODE **and approved** the recommendations contained therein.
- 141        **The Assembly adopted** Resolution XXIII-4.

#### 4.4 OPERATIONAL OBSERVING SYSTEM SECTION

##### 4.4.1 Terms of Reference of the Intergovernmental Committee for GOOS (I-GOOS), the GOOS Scientific Steering Committee (GSSC) and the GOOS Project Office (GPO): Consolidated Proposal

142 The Vice-chairman of IOC responsible for operational observing systems, Dr Radhakrishnan, introduced this item. He first provided a brief overview of what has been a four-year, inclusive process to revise the I-GOOS and GSSC Terms of Reference. The Assembly, at its 21st Session, in 2001, first called for a revision of the organizational structure of GOOS. A four-person review group was formed and reported to the Assembly at its 22nd Session, in 2003. An open-ended intersessional working group was formed at that session to further work on the Terms of Reference, which were presented to the Executive Council at its 37th Session, in 2004. Following the Executive Council, the Member States were invited by IOC Circular Letter No. 2147 to submit their comments on the terms of reference, and the Secretariat sought the views of the three co-sponsoring organizations (UNEP, WMO and ICSU). The currently proposed Terms of Reference consolidate, as far as possible, all of these views and comments.

143 **The Assembly noted** the important work of the Ocean Observations Panel for Climate (OOPC) and agreed that its work as an advisory group to the GSSC should continue.

144 **The Assembly called** for close technical cooperation between I-GOOS and IOC/ABE-LOS.

145 **The Assembly adopted** Resolution XXIII-5, with the revised terms of reference for I-GOOS and the GSSC. **It agreed** that the GPO was an integral part of the IOC Secretariat, and therefore did not require further definition.

146 Noting that the new Terms of Reference of I-GOOS created two additional Vice-chairpersonships, **the Assembly authorized** the Chairman of I-GOOS to make interim arrangements regarding the composition of the I-GOOS Board, taking into account the need for broad geographic representation.

##### 4.4.2 Seventh Session of the Intergovernmental Committee for the Global Ocean Observing System (I-GOOS)

147 The outgoing Chairwoman of I-GOOS, Dr Silvana Vallerga, introduced this item.

148 Thirteen GOOS regional alliances have been formed. The COOP Implementation Plan has been adopted. Two GOOS Regional Fora have been held to date, one in Europe, (Athens, 2003), the other in Fiji (2004), and a third will be held in Africa in the near future. The recent results of a number of GOOS Regional Alliances were presented. The EU-funded GRAND Project, bringing together a number of GOOS Regional Alliances, and its planned continuation, were described. The goals set by I-GOOS in 2002 have been achieved. The I-GOOS, at its Extraordinary Session (UNESCO, 20 June 2005), elected a new Chairperson, François Gérard (France), and two new Vice-chairpersons: Mary Altalo (USA) and Shaohua Lin (China). The outgoing Chairwoman thanked the outgoing Vice-chairpersons who had served with her during her term of office: Rodrigo Nuñez (Chile), Janice Trotte (Brazil) and Guillermo Garcia Montero (Cuba).

149 Brazil expressed reservations with regard to the Summary Report of the 7th Session of I-GOOS (document IOC-WMO-UNEP/I-GOOS VII/3), because it contains some aspects yet to be

clarified by the IOC Secretariat. In particular, Brazil had reservations on the views presented as the GPO Work Plan and Budget for 2006–2007. Furthermore, it believed that the call by I-GOOS for Member States to increase their contribution to programme implementation, by adding new resources, should be preceded by an objective analysis of how much Member States are already investing regionally in GOOS.

150 Numerous Member States, and representatives of observer organizations, expressed the opinion that GOOS should be recognized as the marine component of GEOSS.

151 Some Member States emphasized the potential role of the Regional Subsidiary Bodies of IOC in the implementation of GOOS.

152 Portugal proposed that an evaluation of the GOOS Regional Alliances be provided to I-GOOS.

153 Several Member States noted that GOOS is working well in countries that are data suppliers, but less well in countries that are mainly data users. This was the problem that the GOOS Regional Alliances were set up to solve. Some also expressed the view that some of these Alliances, especially those with fewer resources, such as GOOS–Africa, should be better supported by all Member States.

154 Several Member States pointed out that GOOS, to support its regional efforts, needs a strong Project Office at IOC in Paris, and that, to do this, GOOS needs a budget commensurate with the demands made of it by the Member States.

155 Several Member States indicated that, since GOOS provides measurements relevant to hazard warnings, it should be a key contributor to the development of multi-hazard warning systems.

156 Some Member States expressed the view that the Coastal Pollution Module of GOOS should be reinvigorated and that the Regional Subsidiary Bodies of IOC could contribute to this effort.

157 Numerous Member States thanked the outgoing I-GOOS leadership and welcomed the incoming team.

158 The new Chairman of I-GOOS presented his vision of the future of I-GOOS, noting that it is very much consistent with the discussion that had just taken place in the present Assembly plenary; in particular, to ensure that GOOS is recognized as the marine component of GEOSS. He recognized the need, as expressed by Argentina during the debate, to work closely with IOC/ABE-LOS on law-of-the-sea issues. He fully agreed with the view, expressed by several Member States, that the GOOS Regional Alliances should provide a mechanism for capacity-building in regions.

159 **The Assembly (i) accepted** the Summary Report of the 7th Session of I-GOOS, **and approved** the recommendations therein, noting the reservation expressed by Brazil concerning the GPO Work Plan and Budget; and (ii) **urged** Member States to provide the necessary additional resources to GOOS, either through secondment of staff to the GPO or financial contributions to the IOC Special Account earmarked for support to the GPO.

#### 4.4.3 WMO–IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM): Report on Activities

- 160 The Co-President of the Joint IOC–WMO Technical Commission for Oceanography and Marine Meteorology (JCOMM), Dr Savi Narayanan, introduced this item. She reminded the Assembly that the mandate of JCOMM, as a technical subsidiary body to the Assembly, was extensive, multi-disciplinary in nature, and required the involvement of governments, industry and scientific and technical institutions. JCOMM, at its Second Session (Halifax, Canada, 19–27 September 2005), expects to undertake a comprehensive review of all JCOMM activities over the last four years and of proposals on the major issues, directions and activities concerning the Joint Commission’s work in the next intersessional period.
- 161 JCOMM has clearly demonstrated that the appropriate intergovernmental/international mechanism is now in place to enhance cooperation and coordination in the implementation of a fully integrated marine-observing, data-management and services system. However, there was much that remained to be done, at the national, regional and international levels, and between the oceanographic and meteorological communities, to ensure that the plans defined by JCOMM were fully implemented. Better definition of the different modalities of implementing the systems, monitoring the commitments made, and better integration of the four JCOMM Programme Areas (Services, Observations, Data Management, and Capacity Building) would be required, including, in the case of IOC, working with Coastal-GOOS and the GOOS Regional Alliances and, in a broader context, with the relevant programmes of other UN Specialized Agencies, as well as with the private sector. Fifty-one percent of the Global Ocean Observing System for Climate is now complete, and the JCOMMOPS website ([www.jcommops.org](http://www.jcommops.org)) has many details about the status of the individual observing components. A significant landmark will be reached in September 2005 with the launching of the 1250th drifting buoy, signifying the completion of the first component of GOOS. A number of workshops and conferences have brought together experts from different fields to address the various technical, scientific and training aspects of JCOMM, and have produced results that would guide the work of JCOMM in the next intersessional period. Collaboration with other programmes and organizations is key to the success of JCOMM, and considerable effort is spent on maximizing this synergy at the national and international levels, with governmental and non-governmental bodies. A significant challenge for the work of the IOC will be support of natural-hazard warning and impact mitigation, building in part on existing and planned JCOMM infrastructure and programmes.
- 162 **The Assembly thanked** the Co-President of JCOMM for her comprehensive and informative report, **and expressed** its considerable appreciation to both Co-Presidents, Drs Savi Narayanan and Johannes Guddal, for their enormous contributions to the success of JCOMM over the last four years.
- 163 Many Member States expressed their strong support for JCOMM and its implementation and coordination work for GOOS and for other programme activities of its parent organizations, IOC and WMO. Many emphasized the key role of JCOMM in the efforts of the oceanographic and meteorological communities in all Member States to work together to operationalize oceanography and guide the eventual transition between research results and operational applications.
- 164 Many Member States renewed their current commitments to JCOMM and urged others to contribute to: various components of the observing system defined in the GCOS Implementation Plan; other work of JCOMM, such as JCOMMOPS; provision of oceanographic expertise; and material contributions to the implementation of detailed JCOMM plans in observations, services, data management and capacity-building. One pertinent suggestion was made to produce a short

annual progress report or JCOMM newsletter as a valuable means of increasing visibility of JCOMM within Member States.

165 **The Assembly stressed** the importance of expanded collaboration between the IOC Regional Subsidiary Bodies and the GOOS Regional Alliances, when appropriate, and of balancing coastal and open-ocean requirements, **and urged** JCOMM to seek more-efficient interaction with IODE. **It also stressed** the importance of using existing capacities in support of the Global Tsunami Warning and Mitigation System.

166 **The Assembly restated** its previously expressed view on the importance of the Regional Subsidiary Bodies to all programme implementation.

167 **The Assembly recognized** that current levels of resources in the Regular Programme are inadequate to support the full range of JCOMM recommended activities in: (i) programme planning, coordination and management; (ii) system implementation and maintenance, **and urged** Member States to commit sufficient national resources to allow for the full implementation of JCOMM recommended activities. Given the importance of these proposals, which require resources beyond what can be achieved by the concerted action of Member States alone, **it called on** JCOMM to develop specific proposals and requirements for funding support, for the consideration of Member States, for funding through extra-budgetary resources.

168 **The Assembly expressed** its appreciation to the USA for the continued secondment of an expert (Ms Candyce Clark) to the JCOMM Secretariat; and to WMO for its secondment, over many years, of a professional officer to the IOC Secretariat, in support of a range of joint programme activities. **It recognized** that the WMO secondment had assumed even greater importance with the establishment of JCOMM as a major technical support mechanism for both IOC and WMO, and therefore expressed the wish that this secondment will continue.

169 **The Assembly also expressed** its appreciation to Belgium for the offer to use the facilities in the IOC/IODE Project Office in Ostend (Belgium) for JCOMM data-management training purposes.

170 **The Assembly urged** Member States to participate in JCOMM-II (Halifax, Canada, 19–27 September 2005) and to play an active role first in the formulation and then in the implementation of the approved work plan for JCOMM in the next intersessional period.

#### **4.4.4 Ocean Component of the GCOS Implementation Plan and GOOS Contribution to COP-10**

171 The ex-Director of the Global Climate Observing System (GCOS) Project Office, Dr Alan Thomas, introduced this item. He recalled that the Climate module of GOOS is the ocean component of GCOS. At the request of the UN Framework Convention on Climate Change (UNFCCC), GCOS has engaged, with broad input from the scientific community, in the evaluation and planning of sustained global observations for climate. This included the publication in 2003 of the Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC (GCOS-82), which noted that “*ocean networks are not yet adequate... for data on most variables and in most regions of the planet.*” After broad consultation, GCOS submitted in October 2004 the Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC (GCOS IP) to the UNFCCC Tenth Conference of the Parties (COP-10).

- 172 The GCOS IP calls for a sustained global observing system for climate, based on a mix of high-quality satellite measurements, *in situ* measurements, dedicated analytical infrastructure, and targeted capacity-building. While designed for the monitoring and prediction of climate change and variability, the global component of the ocean observing system as part of GOOS and of GEOSS will contribute to the achievement of many other goals, including improved marine and weather forecasts, ocean forecasts and marine hazard warning. The GCOS IP is the core of the Implementation Plan of the GEOSS Climate societal benefit area. It identifies 41 specific actions in the ocean chapter, with 21 for JCOMM to implement.
- 173 COP-10 encouraged the Parties to strengthen their efforts in implementing priority activities identified in the GCOS IP, as well as welcoming its emphasis on the participation of developing countries; it also asked GCOS for regular reports on the progress in implementing the actions identified in the GCOS IP. A specific report on progress in the implementation of ocean-observing networks was requested and presented to the 22nd meeting of the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) in May 2005. SBSTA asked the Parties to the UNFCCC to comment on the report, and Dr Thomas urged the Member States to use this opportunity to express their views.
- 174 **The Assembly welcomed** the report **and congratulated** GCOS on the achievement of the Implementation Plan. **It also noted** that effective and efficient accounting for and reporting on the national contributions to the ocean observing networks by the GOOS Project Office would be a significant task, and that careful consideration should be given by the Secretariat as to how this will be done.
- 175 **The Assembly:** (i) **instructed** the Executive Secretary to set up a regular system of reporting from Member States on the status of their contribution to the Climate Module of GOOS, taking full advantage of the system monitoring activities of JCOMM, and considering the reporting needs for all the elements of GOOS; **and** (ii) **urged** Member States to: (a) incorporate elements of the GCOS IP, as appropriate and to the extent possible, into their own national ocean-observing plans, and (b) respond to requests from the GOOS Project Office for regular reports on progress in implementing actions identified in the GCOS IP.

#### 4.5 REGIONAL ACTIVITIES

##### 4.5.1 Concept Paper on the Modalities of Implementation of IOC Programmes in Regions

- 176 The Vice-chairman of IOC responsible for regional affairs, Prof. Mario Ruivo, introduced this item. He briefly reviewed the concept paper “Enhancing the Effectiveness of Regional Cooperation in Marine Science and Technology and the Role of the IOC Regional Subsidiary Bodies” (document IOC-XXIII/2 Annex 5) submitted for the consideration of the Assembly. The concept paper recalls the Commission’s long history of regionalization of its scientific, programmes, ocean services and training activities; it then identifies the main problems faced by the regional subsidiary bodies and proposes a strategy for enhancing their role and work, taking into account the major concerns of the Member States at the regional as well as the international level. The Vice-chairman listed a number of actions that can be taken in the immediate future within the present IOC budgetary allocations, and some others within the IOC Medium-term Strategy (2008–2013). These lists of actions were developed on the basis of the Working Document IOC-XXIII/2 Annex 5, by an informal consultation of the officers of some of the regional subsidiary bodies (UNESCO, Paris, 20 June 2005) and by the Intersessional Working Group on the Modalities of Implementation of IOC Programmes in Regions (see agenda item 2.3).



177 Several Member States expressed their strong support for the concepts developed in the Working Document and the Draft Resolution. They considered the Draft Resolution timely and that it appropriately reflected the importance of the link between the development of the activities of the regional subsidiary bodies and the Commission's capacity-building activities at the regional level, especially through mechanisms that are available in the region for such a purpose.

178 Some Member States stressed the importance of adapting the present IOC presence in regions by having far more coordination with other regional or regionally active organizations and by stronger links with regional financial institutions (e.g. regional development banks and donor agencies). Some Member States highlighted the importance of having an assessment of how regional programmes impact the Commission's global programmes and other UN regional programmes. Article 276 of the UN Convention on the Law of the Sea, which calls for the creation of Marine Science Centres, would also have to be kept in mind.

179 Argentina expressed its support for the concept and reminded the Assembly of the creation of a new regional alliance OCEATLAN covering the tropical and southwestern Atlantic Ocean; it is a large network of some 19 marine scientific and technical institutions in three South American countries (Argentina, Brazil and Uruguay; Brazil made a short presentation on the OCEATLAN concept, following the session).

180 Australia considered it important to bear in mind that Member States are uneven in their capacities and that defining and adopting a set of metrics to test effectiveness is necessary prior to deciding whether stronger Regional Subsidiary Bodies or some other more dynamic structure would better serve the Commission's purpose.

181 Some Member States believed that it would be highly desirable to have at least one IOC staff member at Headquarters, taking exclusive responsibility for the Regional Subsidiary Bodies, independently of the IOC Capacity-building Section itself.

182 The Representative of UNEP, Mr Nelson Andrade Colmenares, informed the Assembly that his Organization supports the concept of regionalization of activities and gave some examples of regional programmes that have received strong funding support, especially joint programmes with IOCARIBE. The policy of regional interorganizational cooperation is, he said, firmly embodied in the Cartagena Convention.

183 Chile, Colombia, Ecuador and Peru as well as the Representative of CPPS, Mr Gonzalo Pereira, underscored the many similarities between the aims of CPPS and those of IOC. The signing of a Memorandum of Understanding with IOC (initially in 1984 and more recently updated in 2003) greatly strengthened cooperation between the two organizations. CPPS requested that the provisions of memoranda of understanding between the IOC and other regional organizations, such as CPPS, as a means of supporting development in the regions, be implemented.

184 **The Assembly adopted Resolution XXIII-6.**

#### **4.5.2 Sixth Session of the IOC Regional Sub-Commission for the Western Pacific (WESTPAC): WESTPAC-VI Report**

185 The Chairman of WESTPAC, Dr Hung Tack Huh, introduced this item. He briefly reviewed the results of the 6th Session (Nha Trang, Viet Nam, 23–27 May 2005). Six Member States made specific statements on the subject.

- 186 Australia stressed the need to prioritize projects, and that the WESTPAC resolution to this effect was therefore critical. The relevance of programmes and projects to Member States, and their assessment against measurable results, were the key issues.
- 187 Japan stated that, despite the abolition of RNODCs, which was agreed upon at IODE-XVIII, it will continue to maintain the existing high level of data management in the region and its collaboration with the Sub-Commission to avoid discontinuities in WESTPAC activities. Japan called upon other Member States to do likewise. The establishment of ODIN is an effective way to promote the capacity-building programme of WESTPAC. Japan emphasized the importance of the difficult but necessary prioritization of WESTPAC programmes and projects, as an important step in the desired reform.
- 188 Viet Nam emphasized the problems the region is facing and to which the IOC and IOC/WESTPAC could provide a useful contribution: biodiversity, ecosystems and fisheries, natural-hazard mitigation and coastal-zone management.
- 189 The Republic of Korea emphasized the significance of the reform to be undertaken in the WESTPAC Programme. Korea has a project using sea-surface drifters; it particularly thanked the Government of The Philippines for the permission to deploy these in its waters, and hopes to continue the collaboration in the future, expanding the project to other parts of the WESTPAC region.
- 190 China joined the preceding Member States in commending the Chairman of WESTPAC for the well organized and clear report, and thanked the Government of Viet Nam for very efficiently hosting the session. It also thanked the Government of Thailand for hosting SEAGOOS and facilitating the imminent transfer of the Regional Secretariat to its new Department of Marine and Coastal Resources. With these recent developments, China hoped that WESTPAC could face the new challenges and become more active and play an important role not only in meeting the needs of IOC, but more specifically, of the Member States of the region. China pledged US\$20,000 for WESTPAC activities in the year 2005.
- 191 Thailand will continue to support WESTPAC activities, especially tsunami initiatives, and commended WESTPAC for initiating the regional subsidiary body's reform. It thanked the Government of Viet Nam for having hosted the session.
- 192 The Chairman of WESTPAC expressed his gratitude for the support of the Member States, especially those of WESTPAC, and urged continuing support for the implementation of the WESTPAC Programme in the coming intersessional period.
- 193 The Executive Secretary stressed the importance of the 'revitalization' of WESTPAC and its activities, within the context of the broader constraints which IOC and UNESCO are facing.
- 194 **The Assembly endorsed** the report of the session and its resolutions, **and** in particular **urged** the Sub-commission to implement the planned review and reform of its programme as an urgent priority.
- 195 **The Assembly adopted** Resolution XXIII-7.

#### 4.6 UN CONVENTIONS AND AGREEMENTS

##### 4.6.1 Fifth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS-V): Report of the Chairman

196 The Chairman of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Mr Elie Jarmache, introduced this item. He presented the report and the results of the 5th meeting of the Advisory Body (Buenos Aires, 11–15 April 2005). He thanked the Government of Argentina for hosting IOC/ABE-LOS V, and some of the members of the Argentinian Organizing Committee, especially Dr Ariel González and Capt. Ariel Troisi, who acted as Rapporteur for the meeting. He also thanked the IOC Vice-chairman, Javier Valladares, for his continued support.

197 Thirty-nine countries participated in IOC/ABE-LOS V, as well as the United Nations Office of Legal Affairs, Division for Ocean Affairs and Law of the Sea (UN/OLA/DOALOS). This high level of participation was essential to achieving the results obtained by the Advisory Body at this session.

198 The items discussed at IOC/ABE-LOS V were:

- (i) the practice of Member States in the application of Parts XIII and XIV of UNCLOS (Working Sub-group coordinated by Mrs Elisabeth Tirpak, USA);
- (ii) the procedure for the application of Article 247 of the United Nations Convention on the Law of the Sea by the Intergovernmental Oceanographic Commission (Working Sub-group coordinated by Prof. Alfred Soons, The Netherlands);
- (iii) the legal framework, within the context of UNCLOS, that is applicable to the collection of oceanographic data (Working Sub-group coordinated by Prof. Kari Hakapää, Finland).

199 The information gathered and the conclusions reached by way of the Questionnaire no. 3 are a very valuable tool for improving the practices of Member States with respect to Parts XIII and XIV of UNCLOS. The Chairman of IOC/ABE-LOS thanked Mrs Tirpak and her Sub-group for the work done regarding Questionnaire no. 3.

200 With respect to the legal framework for the collection of oceanographic data, the Chairman of IOC/ABE-LOS informed the Assembly that a rich and intense debate on this subject had taken place at IOC/ABE-LOS V and that the Advisory Body agreed that it is necessary to give legal advice on the following specific activities: (a) deployment of floats within the EEZs; (b) deployment of surface drifters in EEZs; and (c) ships-of-opportunity deploying XBTs in EEZs.

201 Operational oceanography is a key matter for IOC, and IOC/ABE-LOS has been challenged to reconcile different positions on this subject in order to accomplish its mandate.

202 The Executive Secretary informed the Assembly of the activities carried out by the IHO–IAG–IOC Advisory Board on the Law of the Sea (ABLOS), as a forum originally created by IAG and IHO with an exclusive mandate on the technical and scientific related issues to UNCLOS, and the problems arising from the similarity of the names of the two bodies. He recalled that the IOC was invited to join in the sponsorship of ABLOS since 1996 and informed the Assembly of the appointment of Mr Elie Jarmache as the IOC representative to ABLOS, with a view to coordinating the work of both bodies. He finally underlined the need to provide

guidance from Member States regarding ABLOS, so as to avoid duplication of effort with IOC/ABE-LOS.

203           **The Assembly commended** the work of IOC/ABE-LOS and its Chairman.

204           Argentina thanked the IOC for the contributions to the IOC/ABE-LOS V session, which had made it possible to assure a large participation. Argentina recognized that, due to the efforts of the Member States, IOC/ABE-LOS is becoming a forum of juridical reference within the international community.

205           Brazil also stressed the fact that IOC/ABE-LOS has increased its authority within the international community and noted the importance of its work to the practices of Member States regarding Parts XIII and XIV of UNCLOS.

206           Several Member States welcomed the substantial progress made by IOC/ABE-LOS and encouraged it to keep working in order to provide results on the legal framework for the collection of oceanographic data.

207           Spain expressed its support to IOC/ABE-LOS and extended an invitation to host the next session of IOC/ABE-LOS in Málaga, with the support of the Regional Government, the Junta de Andalucía, which is fully engaged with the Spanish Government in law-of-the-sea matters.

208           **The Assembly thanked** Spain for this kind offer **and accepted** it.

209           **The Assembly supported** the recommendations of IOC/ABE-LOS, **expressing** its expectation of new results to be achieved by the Advisory Body.

210           Germany acknowledged the work of IOC/ABE-LOS, but considered that its continuation and mandate should be continually reviewed in the light of requirements and available budgetary resources, particularly in view of the current financial constraints faced by IOC.

211           The Chairman of IOC/ABE-LOS shared the concern about the financial situation, but pointed out that IOC/ABE-LOS is one of the least expensive activities of the IOC, that IOC/ABE-LOS only pursues the mandate given to it by the IOC governing bodies, and that currently it is charged with only one task: the legal framework for the collection of oceanographic data.

212           **The Assembly endorsed** the oral report on the 5th Session of IOC/ABE-LOS presented by its Chairman.

213           **The Assembly adopted** Resolution XXIII-8.

#### **4.6.2 Appropriate IOC Internal Procedure Related to an Effective Use of Article 247 of the UN Convention on the Law of the Sea: IOC/ABE-LOS Proposal**

214           The Chairman of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Mr Elie Jarmache, introduced this item. He invited the Assembly to address questions to the Coordinator of the Sub-group on the "Procedure for the application of article 247 of the United Nations Convention on the Law of the Sea by the Intergovernmental Oceanographic Commission", Prof. Alfred Soons (The Netherlands), who accompanied him on the podium.

215           Portugal reminded the Assembly that the application of Article 247 would facilitate the development of operational oceanography.

216           **The Assembly commended** the work undertaken by Prof. Soons **and endorsed** the "Procedure for the application of Article 247 of the United Nations Convention on the Law of the Sea by the Intergovernmental Oceanographic Commission". **The Assembly urged** the Member States to use this Procedure in the implementation of IOC programmes whenever possible and to explore the potential benefits of such application for the facilitation of operational oceanography.

#### **4.6.3 Criteria and Guidelines on the Transfer of Marine Technology: Dissemination and Implementation Report**

217           The Chairman introduced this item. He presented the publication on the "Criteria and Guidelines on the Transfer of Marine Technology."

218           Many Member States stressed the usefulness and importance of the Criteria and Guidelines on the Transfer of Marine Technology and expressed the wish that the Executive Secretary take the necessary action to follow up the recommendation in the Guidelines and report the results to the 39th Session of the Executive Council.

219           **The Assembly expressed** its satisfaction with the publication and dissemination of the Criteria and Guidelines **and adopted** Resolution XXIII-9.

#### **4.6.4 United Nations Oceans and Coastal Areas Network (UN-Oceans): Report on Activities**

220           The Executive Secretary introduced this item. In November 2001, the UN Administrative Committee on Coordination (ACC) concluded that all its subsidiary bodies, including the Sub-Committee on Oceans and Coastal Areas (SOCA), should cease to exist by the end of 2001 and that future inter-agency support requirements would best be handled through *ad hoc*, time-bound, task-oriented arrangements using a lead-agency approach.

221           In September 2003, the United Nations High-Level Committee on Programmes approved the creation of an Oceans and Coastal Areas Network (subsequently named UN-Oceans) to build on ACC/SOCA, covering a wide range of issues and composed of the concerned bodies of the UN system, including the International Seabed Authority, and the secretariats of the relevant international conventions, notably the Convention on Biological Diversity.

222           The IOC hosted the first meeting of UN-Oceans in January 2005, and the partners adopted the Rules of Procedure and the Terms of Reference (document IOC/INF-1210). The participants in UN-Oceans endorsed the continuation of the IOC Executive Secretary as Coordinator of UN-Oceans and called on the IOC Secretariat to serve as the implementing secretariat for UN-Oceans. Four UN-Oceans Task Forces were established: (i) on Post-Tsunami Response; (ii) on the Regular Process for Global Assessment of the Marine Environment; (iii) on Biodiversity in Marine Areas beyond National Jurisdictions; (iv) on the Second Intergovernmental Review of the Global Programme of Action for Protection of the Marine Environment from Land-based Activities. UN-Oceans held its second meeting on 2–3 June 2005, in conjunction with the UN Open-Ended Informal Consultative Process on Oceans and the Law of the Sea. The report on the discussions will be made available at a later date.

223           **The Assembly thanked** the Executive Secretary for his efforts to move forward the coordination of ocean and coastal area activities of the UN Programmes and Specialized Agencies. **The Assembly reaffirmed** its agreement that IOC should also play a leading role in

the development of the regular process for global reporting and assessment of the state of the marine environment.

224 The Executive Secretary pointed out that the start-up phase of GMA was the topic of the Second International Workshop on the Regular Process for the Global Reporting and Assessment of the State of the Marine Environment (New York, 13–15 June 2005). The Workshop recommended that the General Assembly, at its 60th Session, invite IOC and UNEP jointly to take the role of lead agencies for the Assessment of Assessments.

225 **The Assembly instructed** the Executive Secretary to prepare a one-page brief explaining the appropriateness of a joint-leading-agencies role for IOC and UNEP, stressing past cooperation between the two organizations. This brief should be distributed to the relevant institutions in the Member States to seek support for the adoption of the General Assembly resolution on Oceans and the Law of the Sea, at its 60th session.

#### 4.7 CAPACITY-BUILDING

##### 4.7.1 IOC Principles and Strategy for Capacity-Building: Final Draft

226 The Director of the Centre for Marine Tropical Ecology (Bremen, Germany) and Chairman of the IOC Consultative Group on Capacity-building (CGCB), Prof. Venugopal Ittekkot, introduced this item. He requested the Chairman to allow the presentations for agenda items 4.7.1 and 4.7.2 to be made sequentially and the discussion of these items to be held following them.

227 A draft Strategy for Capacity-building was presented to the Executive Council at its 37th Session, in June 2004. By Resolution EC-XXXVII.9, the Council instructed the IOC Executive Secretary to produce a final draft Strategy for Capacity-building for consideration by the Assembly at its 23rd Session, based on inputs from Member States.

228 The draft Strategy was modified by incorporating comments from Member States (made during the discussion at the 37th Session of the Executive Council, and through written responses to Circular Letter no. 2119 inviting further comments), and in January 2005 was uploaded to an electronic discussion forum to stimulate further inputs and ideas. The status of the draft was discussed at an expert workshop on drafting an Implementation Plan for the IOC Strategy for Capacity-building (UNESCO, Paris, 9–11 March 2005). The finalized draft submitted to the Assembly at the present session is therefore the result of wide and inclusive consultations. Many parts of the earlier draft have been significantly modified or overhauled in order to fully incorporate the advice from Member States and the CGCB. An important step was to establish an acceptable vision statement; it was commented upon and critically debated, since it set the Medium-term goals for the Capacity-building Section of IOC. The final version reads:

*The vision of IOC Capacity-building is to establish networks of scientists, managers and other practitioners working within regional and similar cooperative mechanisms, to create demand-driven science, enhance sustainable development and protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity.*

229 The Strategy is articulated to operate within the larger IOC mandate; most fundamentally, it will harmonize all on-going IOC capacity-building initiatives so that they operate within the general frame of the IOC Principles of Capacity-building. Other important points of the Strategy document are:

- (i) Recognizing ongoing regional projects, addressing priority regional concerns, as the primary vehicles for capacity-building interventions: active assistance needs to be provided to scientist networks, to conceive capacity-building pilot programmes and draft 'business-like' proposals to secure the necessary funding.
- (ii) Making the case to decision-makers by rapid demonstration of results from capacity-building interventions, thereby encouraging national contributions to long-term monitoring, training in the development of GOOS operational products, application of remote-sensing data and the use of robust models: all these needs to be in close partnership with GOOS, JCOMM, CEOS and other relevant organizations and programmes.
- (iii) Giving due priority to education and research in capacity-building pilot programmes: such know-why is the necessary long-term component to complement the shorter-term know-how that training fulfils.
- (iv) Paying special attention to country-specific programmes by building up institutional and legal frameworks, encouraging mutual assistance, and assisting in transfer of technology: all interventions need to take into account the different capacities for marine scientific research in the countries of a given region.
- (v) Raising awareness at all levels of decision and policy-making, scientific institutions, general public and students.
- (vi) Developing funding mechanisms to augment the primary one of IOC-assisted drafting of funding proposals: besides the standard models of contributions to the IOC Trust Funds, some innovative suggestions to accept industrial donations have been made.
- (vii) Developing and applying performance indicators to capacity-building interventions that will be useful to scientists, funding agencies, decision-makers and the general public.

[For discussion of this agenda item, please refer to agenda item 4.7.2 of the Summary Report].

#### **4.7.2 Implementation Plan for the IOC Strategy for Capacity-Building: Final Draft; Guidelines on Best Practices in Capacity-Building**

230 The Director of the Centre for Marine Tropical Ecology (Bremen, Germany) and Chairman of the IOC Consultative Group on Capacity-building (CGCB), Prof. Venugopal Ittekkot, introduced this item, immediately following his presentation for Agenda item 4.7.1.

231 Resolution EC-XXXVII.9 instructed the Executive Secretary to produce a final draft Strategy for Capacity-building and develop an associated Implementation Plan, building on existing initiatives, for consideration by the 23rd Session of the IOC Assembly, that:

- (i) is in accordance with the new IOC Medium-term Strategy;
- (ii) assesses the extent and impact of existing and past capacity-building efforts;
- (iii) has specific terms of reference and associated performance measures for all elements;

- (iv) takes account of GOOS and JCOMM capacity-building action plans; and
- (v) outlines a feasible and robust means of support and resources for capacity-building.

232 Prof. Ittekkot noted that, in response to the Executive Council's instruction, the IOC Secretariat, in consultation with regional representatives, experts and members of the CGCB, had produced a draft Plan by:

- (i) inviting all Member States (through Circular Letter no. 2140), the Chairpersons of IOC Regional Subsidiary Bodies, members of the Consultative Group for Capacity-building, and donors, to participate in the workshop to draft an Implementation Plan;
- (ii) preparing a draft framework for the Implementation Plan for the IOC Strategy for Capacity-building, in consultation with the IOC regional offices;
- (iii) uploading the draft to a Discussion Group website to facilitate further inputs and ideas from regions;
- (iv) discussing further regional input and prioritization at an Experts Workshop on drafting an Implementation Plan for the IOC Strategy for Capacity-building (UNESCO, Paris, 9–11 March 2005); and
- (v) finalizing the document in consultation with the regions after the Workshop.

233 The Plan presented to the Assembly was therefore the result of wide and inclusive consultations with IOC regions on the:

- identification of regional projects that address issues of regional concern and are in the frame of the IOC Medium-term Strategy;
- definition and prioritizing of capacity-building needs in more effectively meeting regional project objectives;
- detailing deliverables of capacity-building interventions and associated performance indicators.

234 He noted that the prioritized list of regional requests called for:

1. Capacity-building through leadership training for heads of institutions, coupled to team-building for networks of scientists, and followed by proposal-writing workshops for projects addressing regional priorities with operational products and remote sensing. Research and education were perceived as important avenues for the long-term.
2. Training in GOOS operational products, remote sensing/GIS tools, and sea-level issues;
3. Training in Integrated Coastal Area Management tools, when coupled to coastal ecosystem monitoring/protection, and coastal model demonstrations for decision-makers;



4. Training in mitigating the effects of tsunamis and other marine hazards, and associated coastal bathymetry and mapping of vulnerabilities were the most requested set of interventions in terms of preparedness for extreme events;
5. Data and information management and exchange were perceived as important by all regions.

235 JCOMM, GOOS/COOP and the satellite community (e.g. CEOS, COSPAR, PORSEC, WAPMERR) were perceived as partner entities/programmes. Deliverables, measured against quantifiable performance indicators, were defined with professional assistance.

236 The regional consultations that followed the Executive Council directives to document best practices, define performance measures, and outline feasible and robust means of support and resources for capacity-building, have resulted in the draft of an Implementation and Business Plan that is in agreement with the IOC Principles and Strategy for Capacity-building and is the expressed requirements of the regions. As new IOC regional bodies may be constituted, their Implementation and Business Plans will accordingly be drawn up in consultation and presented to the Assembly for approval. The same applies to the needs of individual Member States, which will be addressed within the guidelines of the Principles and Strategy for Capacity-building.

237 The Chairman reminded the Assembly that the discussion should now address Agenda items 4.7.1 and 4.7.2 together.

238 The Executive Secretary thanked the Government of the USA for the support provided for several capacity-building activities, and the Government of Germany for allowing Prof. Ittekkot to spend time in shaping the Strategy and Implementation Plan.

239 **The Assembly thanked** the Secretariat for the comprehensive documents produced, noting significant improvement since the last Executive Council, and the efforts devoted to involving Member States in the formulation of the Strategy and Implementation Plan.

240 **The Assembly emphasized** the need to avoid duplication in the context of limited funds, by harmonizing and efficiently coordinating IOC capacity-building activities, and collaborating with UNESCO's cross-sectoral capacity-building activities. The GOOS framework should be used as a platform for the regional approach. Whilst Regional Subsidiary Bodies should be involved in their regions' capacity-building and work with other indigenous regional organizations, it was important that the Secretariat assume a coordinating role.

241 **The Assembly welcomed** the fact that the Strategy includes a country-specific approach to complement the regional approach.

242 Several African countries highlighted the need for institutional capacity-building in countries with insufficient instrumentation and resources.

243 However, noting the limited resources available, **the Assembly recommended** regional sharing of existing facilities, since this would also strengthen regional and South-South collaboration. The importance of this type of collaboration was also pointed out because rich expertise has been acquired within developing regions, and IOC should help catalyse its application within regional networks.

244 Brazil, China, Cuba, India, Indonesia, Iran, the Republic of Korea, Russia, Spain, Tanzania and Venezuela generously proposed to share their experience or facilities in capacity-

building. The emphasis on regional networks of scientists was accepted as an important method of addressing regional concerns.

245 **The Assembly welcomed** the goal of self-directed capacity-building **and acknowledged** it as an optimum approach to achieve sustainability of interventions. Besides proposals to international and regional funding agencies, and traditional donors, it was proposed that regional networks of scientists actively seek collaboration with the private sector, including offshore petroleum and fishing industries. The necessity of increasing political support for capacity-building was also emphasized repeatedly.

246 Several Member States noted the importance of learning from past successful and less successful programmes of IOC in capacity-building, in particular that the incomplete implementation of the Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries (document IOC/INF-612), formulated two decades ago, was mainly due to insufficiency of funds. The situation is very different today, with many more countries that have developed the capacity to undertake new programmes, and that have expressed their willingness to share their expertise and facilities regionally. It would still be prudent, however, not to raise unrealistic expectations, as the large external funding needed to achieve all the goals of this Strategy and the Implementation Plan will be difficult to obtain.

247 Several Member States proposed a stocktaking of past IOC capacity-building achievements, to evaluate results and highlight the contribution of Member States, and full advantage should be taken of new technologies to optimize the impact of resources.

248 Canada requested the inclusion of disadvantaged sections of society in capacity-building activities.

249 The IOI offered to share its experience in establishing a network of IOC alumni as a means of keeping track of achievements and catalysing regional collaboration.

250 **The Assembly adopted** Resolution XXIII-10 endorsing the Principles and Strategy for Capacity-building. **It also adopted** Resolution XXIII-11 accepting the initial Implementation Plan and initiating implementation.

#### **4.7.3 IOC Plan for Capacity-Building in Remote Sensing in Oceanography: Progress Report**

251 Dr Kristina Katsaros, Chairwoman of the Pan-Ocean Remote Sensing Conference (PORSEC) introduced this item. She presented a case study related to the 2004 PORSEC Conference which was preceded by capacity-building courses, partially supported by IOC, at the University of Concepción, Chile. She stressed the mutual benefits accruing to participants in capacity-building courses and to funding partners. The PORSEC approach has long-term benefits by fostering local alliances and forging regional leadership. Remote sensing is a powerful cost-effective tool, which is now well established and affordable for research, for the application of research results, policy-making and management. PORSEC is a young organization whose initial focus was on Pacific Rim countries. However, the Association is now expanding to all oceanic areas, thus reflecting its new name 'Pan-Ocean Remote Sensing Conference Association'.

252 **The Assembly thanked** Dr Katsaros for her clear presentation **and reaffirmed** its appreciation of the partnership between IOC and PORSEC.

253        **The Assembly recognized** that due attention must be given to a geographical balance of IOC activities in remote sensing **and recommended** that PORSEC plan workshops in regions such as Africa, the Caribbean and eastern Europe, and use IOC contacts to reach young scientists in developing countries. The usefulness of these workshops could be augmented by the reproduction of the course materials in local languages.

254        **The Assembly also recommended** that IOC use its existing programmes, such as BILKO, in close cooperation with regional bodies, for developing training modules based on regional needs. Benefits from these workshops would accrue to fisheries, coastal management and oceanographic research.

255        Some Member States expressed a wish to work with the members of PORSEC in remote-sensing techniques that are used in conjunction with *in situ* measurements and numerical models, leading to the delivery of products that meet societal needs.

#### 4.8        RESPONSE IN THE AFTERMATH OF THE 26 DECEMBER 2004 TSUNAMI               IN THE INDIAN OCEAN

##### **4.8.1    Early Warning Systems: World Conference on Disaster Reduction (WCDR),               Kobe, Japan: Conference Results**

256        The Executive Secretary introduced this item. He recalled that the devastating earthquake and tsunami of 26 December 2004 had killed over 200,000 people and caused huge destruction in several countries around the Indian Ocean basin. He noted that Member States in the region had acted quickly to start the process to establish a tsunami warning and mitigation system for the Indian Ocean region to ensure that people would never again be caught unprepared for this rare but high-impact disaster.

257        He informed the Assembly that UNESCO/IOC had been requested to lead the process of establishing an Indian Ocean Tsunami Warning and Mitigation System (IOTWS) on several occasions, such as the Special ASEAN Leaders' Meeting (Jakarta, 6 January 2005), the UN Conference on Small Island Developing States (Port Louis, 14 January 2005), the UN General Assembly (New York, 19 January 2005) by Resolution 59/279, the Common Statement of the Special Session on Indian Ocean Disaster and the Hyogo Framework for Action 2005–2015, both adopted at the World Conference on Disaster Reduction (Kobe, 22 January 2005), the Ministerial Declaration in Phuket (29 January 2005), the GEO Communiqué (Brussels, 16 February 2005), and several technical meetings held in China, India and Indonesia.

258        To enable the IOC to address this request, the IOC Secretariat had submitted, with UN/ISDR, a joint proposal to UN/OCHA within the framework of the Tsunami Flash Appeal (6 January 2005). In this proposal an amount of US\$3.5 million was requested for the establishment, by IOC, of the early-warning component of the IOTWS. The proposal was approved and the activities started in March 2005. The activities included in the project are: (i) organization of two coordination meetings to address the governance of the IOTWS; (ii) the implementation of national assessment missions to identify existing and necessary capacity for the establishment and operation of a national tsunami warning and mitigation system (within a multi-hazard framework); (iii) support of national tsunami awareness promotion; (iv) upgrading and expansion of the existing GLOSS sea-level network to enable tsunami detection; and (v) start-up of technical tsunami training.

259        The Executive Secretary informed the Assembly that an "International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian

Ocean within a Global Framework” had been held in UNESCO Headquarters, 3–8 March 2005. The Meeting was attended by nearly 300 participants from 21 Indian Ocean region countries, 25 other IOC Member States, 24 organizations and 16 observers. The Meeting ensured that Indian Ocean Member States were fully informed, at the technical level, on tsunami warning and mitigation programmes at the national, regional and global levels. The Meeting adopted a communiqué that provided guidance to all partners regarding the required actions that will lead towards the establishment of an Indian Ocean Tsunami Warning and Mitigation System. The Meeting stressed that the regional system would be a coordinated network of national systems; the warnings would be the responsibility of each participating country; and the effective operation of the regional system would require sharing of relevant observational data. The Meeting also recommended the establishment of an “Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS)” and drafted Terms of Reference for the Group.

260 It was further agreed by the Meeting, while a full system was being developed, to establish an “interim” system that would provide tsunami information advisories. This service was provided as from the 1 April 2005, consisting of a network of National Tsunami Focal Points receiving advisory information on tsunamis from the Pacific Tsunami Warning Center (PTWC) and the Japan Meteorological Agency (JMA). This solution is being further enhanced with a US\$0.5 million project component to install and/or upgrade sea-level gauges in affected countries, to cover the immediate sea-level observation gaps in the Indian Ocean. The Executive Secretary reported that five sea-level gauges were now transmitting data in real-time from the Indian Ocean basin.

261 The “Second International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean” (Grand Baie, Mauritius, 14–16 April 2005) was attended by nearly 192 participants from 24 countries in the Indian Ocean region, 9 other IOC Member States, 12 organizations, and 27 observers. The Meeting noted progress reports by the participating Member States, approved the work plan prepared by the IOC Secretariat and adopted the Mauritius Declaration strengthening the Paris consensus. Several donors pledged financial support, amounting to approximately US\$5 million, including Belgium, Germany, Italy and Norway. Several others, including Australia, France, Germany, Japan, the United States of America, as well as the European Commission, also indicated their continuing support and their willingness to provide more financial aid as the plans for the system became more clearly defined.

262 The Mauritius Declaration called for countries to assess requirements and capacity-building needs by July 2005, followed by the development of national strategic plans.

263 As from the end of May, IOC has started the implementation of national assessment missions, in response to requests received from 19 countries in the region. The objectives of these missions are to: (i) inform national stakeholders of the requirements (organizational, infrastructural and human resources) for the establishment and operation of a tsunami warning and mitigation system; (ii) assess the available resources; (iii) promote the establishment of national coordination committees involving the widest possible range of stakeholders; and (iv) identify capacity-building needs.

264 The Executive Secretary recalled that the development of the IOTWS has been approached in an inter-agency and complementary fashion. This has been addressed by IOC through its close collaboration and partnership with WMO, ISDR and the IFRC, for the assessment missions, for example. Prior to and during the assessment missions, close relations have been established with UNDP, USAID, UN/OCHA and others.

- 265 In terms of future actions, an additional 20 sea-level stations will be put in place or upgraded by October 2005. This would include the installation of seven new gauges (for India, Indonesia, Malaysia, Myanmar and Thailand) and the upgrading of 11 existing gauges (in Kenya, Maldives, Mauritius, Oman, Tanzania, Seychelles, Sri Lanka, and UK).
- 266 The Executive Secretary noted that IOC's response to the 26 December 2004 tsunami had been swift and a tsunami team had been created within the Secretariat very early on. This team included Mr Peter Pissierssens (Ocean Services), Mr Bernardo Aliaga (ADG Office), Mr Keith Alverson (GPO), Mr Thorkild Aarup (GPO) and Ms Laura Kong (ITIC, Hawaii). In addition, France had kindly made Mr François Schindelé (Chair ITSU) available as a technical expert for a period of six months (February–July 2005) and Japan had provided significant time from the head of the tsunami unit of JMA, Mr Masahiro Yamamoto. This team had been able to respond rapidly to the considerable demand on UNESCO and its IOC while maintaining other IOC priority activities in 2005.
- 267 Mr Salvano Briceño, Director of the UN/ISDR Secretariat in Geneva, expressed his appreciation to the Intergovernmental Oceanographic Commission (IOC) for inviting the ISDR to the 23rd Session of its Assembly. He reported that a UN Flash Appeal is currently being coordinated by the ISDR's Platform for the Promotion of Early Warning, with the core technical leadership provided by the IOC. Support received so far amounts to about US\$11 million. The Flash Appeal project is aimed at developing and strengthening early-warning capacity in the countries affected by the tsunami, as part of a needs-based approach, particularly to support the work of IOC, but also that of WMO, OCHA, ESCAP, UNDP, UNEP, UNU, the Asian Disaster Reduction Centre (ADRC), the Asian Disaster Preparedness Centre (ADPC) and other partner organizations.
- 268 Mr Briceño also stressed the importance of risk reduction as a central theme of the intergovernmental agreement, the Hyogo Framework for Action, 2005–2015: Building the Resilience of Nations and Communities, adopted in Kobe, Hyogo, Japan at the World Conference on Disaster Reduction (WCDR). In this context, Mr Briceño reaffirmed the ISDR Secretariat's commitment to this process and in particular to the efforts of the IOC and UNESCO in the critical task of reducing tsunami risks.
- 269 Australia informed the Assembly that it had decided to establish an Australian Tsunami Warning System that will cover the Indian and Pacific Ocean coasts of Australia. The system will consist of a single centre with sites in Melbourne and Canberra which will receive and analyse data, provide tsunami advice and provide tsunami warnings within 30 minutes of a tsunamigenic event. Australia is upgrading or putting in place real-time oceanographic and seismic observation systems along the southern stretch of the Sunda Trench, as well as throughout the southwest Pacific. An additional amount of AU\$68.9 million has been allocated to develop the Australian Tsunami Warning System. The Australian Government is strongly committed to the development of tsunami warning capability, as well as to sharing relevant data with other Indian Ocean countries, and will make available AU\$500,000/year for regional tsunami related training. Australia further offered to host the Secretariat for the IOTWS in Perth, located at the existing IOC Perth Regional Programme Office, as well as the first Session of the ICG/IOTWS. Australia recommended that the 2nd Session of the Group be organized before the end of the year to consider further capacity-building needs.
- 270 Indonesia informed the Assembly that it has developed a master plan for the Indonesian end-to-end tsunami warning system. The system will involve 47 seismic and 80 tide gauges. This is being implemented through cooperation with, China, France, Germany and Japan. In addition

to the technical components of the system, public awareness and preparedness activities will also be undertaken.

- 271 India has a strong commitment to the development of the IOTWS. It has allocated US\$30 million to the development of its national tsunami warning system. The system will cover both tsunamigenic areas that affect the Indian Ocean: Sumatra and Makran. The planned activities will, in terms of observation systems, include (i) a network of land-based seismic stations for earthquake detection and estimation of focal parameters in tsunamigenic zones; (ii) indigenous development of a deep-ocean assessment and reporting system; (iii) setting up a network of 50 automatic tide gauges; (iv) enhancement of upper-ocean and ocean-surface meteorological observations; and (v) setting up coastal observing radars and current-meter moorings. It will also include modelling (tsunamis, storm surges, coastal vulnerability), creation of high-resolution bathymetry, inundation mapping, development of a decision-support system, setting up a dedicated Early Warning Centre for Tsunami and Storm Surge. These activities will be accompanied by relevant research and development in seismology, ocean sciences and related capacity-building, training and education. India offered to host the Second Session of the ICG/IOTWS, recommended by Australia, in Hyderabad, India. India expressed some reservations on paragraph 12 of Resolution XXIII-12. India however accepted the consensus while formally withdrawing its name from the list of co-sponsors for the Resolution.
- 272 The Islamic Republic of Iran informed the Assembly that it is collaborating with India and Pakistan in the development of a sub-regional tsunami warning system for the Makran region. An Iranian national tsunami-warning committee and centre have been established.
- 273 Japan informed the Asssembly that it has contributed to the process of establishing the Indian Ocean Tsunami Warning and Mitigation System and that the Japan Meteorological Agency (JMA) has provided interim tsunami advisory information since March 2005 and actually issued the tsunami alert information to twenty-five countries. Japan also pointed out the important role of an earthquake observation network to provide necessary information for tsunami early warning and mitigation, and committed its contribution in this field.
- 274 The Republic of Korea has undertaken simulated preparedness drills to evaluate its tsunami warning and notification system, involving all stakeholders in the national system and assessing the promptness and completeness of the messages sent and received. Korea offered to share its expertise and experience in this regard with the Indian Ocean countries.
- 275 Kenya expressed its appreciation of the national assessment mission that visited Kenya recently and also strongly welcomed the fact that the mission had been able to meet Somalian officials. Kenya recommends strengthening regional collaboration in the East African region in tsunami and other natural-disaster management, and offered Kenya's assistance in coordinating such cooperation.
- 276 Mauritius informed the Assembly that through bilateral cooperation with India, it will develop tsunami inundation maps and build national capacity in this regard. Mauritius urges donors not to lose sight of the smaller countries in the region, as well as those in the East Africa region. It has also requested that some of the remaining relief funds be utilized for investment in disaster-reduction and awareness-raising. Mauritius also stresses the importance of taking into account traditional (indigenous) knowledge relative to natural disasters.
- 277 Thailand announced that the National Disaster Warning Centre of Thailand (NDWC) had been officially opened on 30 May 2005. The Centre has the capability to receive and analyse real-time multi-hazard observational data, and to issue warnings through various means,

including a number of warning towers in risk areas, real-time media channels and through SMS to over 20 million mobile phones in Thailand. A tsunami evacuation drill had been organized on 29 April 2005 for residents and foreign tourists in high-risk areas, especially along the Andaman coast. Thailand has been cooperating with the Asian Disaster Preparedness Centre (ADPC) in establishing partnerships with stakeholders in the Indian Ocean and Southeast Asian regions to set up regional tsunami warning arrangements in the region. Support was received by ADPC from a number of countries (Cambodia, China, Lao PDR, Philippines, Singapore, Thailand and Viet Nam) in this regard. ADPC will establish and install a distributed network of monitoring stations and a data-communication system in the region. Thailand initiated the Multi-Donor Voluntary Trust Fund for Tsunami Early Warning Arrangements in the Indian Ocean and Southeast Asia, to which Thailand pledged US\$10 million as seed money. Thailand will host, on 26 December 2005, a memorial event for the victims of the tsunami disaster.

278 South Africa informed the Assembly that the establishment of the IOTWS is a high priority issue in South Africa. Within the framework of NEPAD, South Africa offered its expertise in geosciences, disaster management and response, and in other relevant disciplines, especially to African coastal countries.

279 Norway reminded the Assembly of its pledge, at the second Coordination Meeting for the Development of Tsunami Warning and Mitigation System for the Indian Ocean, of US\$2 million to the IOTWS effort. Agreement had now been reached that these funds will be provided for the following purposes: (i) to assist the IOC Secretariat in its coordinating role; (ii) to strengthen and expand the sea-level observation network; and (iii) to assist individual countries especially developing ones, that have specific needs.

280 Italy informed the Assembly that it had committed financial support of US\$1.2 million to: (i) collect high-resolution bathymetric data; (ii) prepare inundation maps; and (iii) assist with capacity-building.

281 Canada announced that, through the Canadian International Development Agency, it will invest Canadian \$1 million in support of the development of the Indian Ocean Tsunami Warning System; this includes a contribution of Canadian \$500,000 in response to the UN Flash Appeal for the fast-track implementation of a tsunami warning and mitigation system for the Indian Ocean, and an additional investment of up to Canadian \$500,000 for bilateral tsunami warning system capacity development with a developing nation in the region. In addition, Canada will be providing a Canadian \$25,000 voluntary contribution to the IOC Trust Fund to assist the Commission in the effective provision of services by the ICG/ITSU.

282 The United States of America welcomed the proposal to establish the ICG/IOTWS, offered its national tsunami warning and mitigation expertise and encouraged interoperability between the planned IOTWS and other national (such as the USA's) and regional (such as ITSU) systems.

283 Germany reported that the automatic Indonesian-German seismic system was installed on 9 June 2005, is now operational and started delivering real-time seismic data and information to the Centre in Jakarta. It is envisaged to install as a next step the first seafloor equipment and two buoys in Indonesian waters early in October 2005 using Germany's Research Vessel *Sonne*. To further support UNESCO/IOC, and in agreement with the Indonesian partners, it is planned to strengthen UNESCO's Regional Office in Jakarta and the UNESCO/IOC Secretariat, through the provision of two German experts. Germany also cooperates with Sri Lanka in the field of hydrography and oceanography and has already provided hydrographic and oceanographic equipment. Under the GLOSS Programme, Germany will soon install two tide gauges.

- 284 France announced that it will undertake a bathymetric survey with the RV *Marion Dufresne* in Indonesian waters. In addition, a study on the generation, propagation and magnitude of tsunamis will be implemented, covering the oceanic part of the Indian Ocean region. The National Centre of La Réunion will be reinforced and will be given a sub-regional role. This will include the upgrading of a seismic station in Djibouti, Hyderabad, Canberra and La Réunion, and the deployment of a seismic stations and a sea-level gauge in Madagascar. France will also provide experts for the national assessment missions organized by IOC, WMO and ISDR. France will also contribute to raising public awareness through the re-editing and reprinting of the book “Great Waves” in French. The total support for the above-mentioned activities will amount to €1.5 million and will complement bilateral actions that were started after the 26 December 2004 tsunami, such as cooperation with Indonesia on the coastal zone impact of the tsunami, the equipment of a maritime meteorological warning station, and support to civil defence stations and public education. These bilateral support actions amount to over €6 million. Similar actions are being planned with Sri Lanka and Seychelles.
- 285 Belgium informed the Assembly that the Government of Flanders contributes to the IOTWS development through the ODINAFRICA Project which involves the upgrading or deployment of sea-level gauges along the African coast. The Government of Flanders will also provide €500,000/year for a period of five years to fund training activities at the IOC project office for IODE (Ostend, Belgium) related to oceanographic data management as well as tsunami-related training. These funds could be used for participants from the Indian Ocean region, as well as from other developing regions.
- 286 The Representative of the International Hydrographic Organization (IHO) briefly informed the Assembly of his Organization’s activities related to tsunamis. These include: (i) the use of the worldwide navigational warning service to broadcast tsunami warnings; (ii) a special session during the 3rd Extraordinary International Hydrographic Conference (Monaco, April 2005) to discuss possible assistance to the affected countries. He noted that elements of future collaboration with UNESCO/IOC could include bathymetry and improved use of maritime warning systems to broadcast tsunami warnings.
- 287 The Representative of the World Meteorological Organization (WMO) informed the Assembly that his Organization is working closely and effectively with IOC and ISDR on the establishment of the IOTWS. He informed the Assembly that WMO has initiated the following project activities: (i) the Global Telecommunication System (GTS) will be upgraded, where needed, to address requirements of tsunami-related data communication; (ii) WMO will assist in the development or enhancement of multi-hazard early-warning systems of the national Meteorological and Hydrological Services (NMHS) to support 24/7 dissemination of tsunami warnings, and to raise public awareness through the development of their educational and public outreach programmes; (iii) WMO will collaborate with UNESCO/IOC on further developing tsunami-related educational tools, materials, building upon the existing IOC tsunami-related materials, for the use of the NMHSs; and (iv) through its Plan of Action for the coordination of space systems, WMO will contribute to multi-hazard early-warning systems. WMO is participating in the national assessment missions, coordinated by UNESCO/IOC, and is also implementing specific national missions related to the improvement of the GTS in Bangladesh, Comoros, Djibouti, Indonesia, Kenya, Madagascar, Maldives, Myanmar, Seychelles, Somalia, Sri Lanka, Tanzania and Yemen.
- 288 The Representative of WAPMERR informed the Assembly that her Organization is starting the implementation of a regional Pilot Project for the creation of an expert system for tsunami hazard assessment and risk modelling in the SEAGOOS area. A regional office will be established for this project in Bangkok. The system will include historical data bases, tsunami



modelling, hazard assessment and risk-calculation tools and will be applicable at the national and regional levels. The project products and experience will be shared with SEAGOOS members during workshops planned by WAPMERR.

289           **The Assembly expressed** its gratitude to the Japan Meteorological Agency and the USA's Pacific Tsunami Warning Center for providing the interim tsunami advisory information service to the region and invited these agencies to continue this valuable service.

290           **The Assembly noted** with appreciation the strong commitment of governments in the Indian Ocean region to establish national systems within a regional IOC-coordinated framework.

291           **The Assembly expressed** its appreciation for, **and endorsed**, the activities and initiatives undertaken by the IOC Secretariat in response to the 26 December 2004 tsunami.

292           **The Assembly welcomed and strongly supported** the leading role accorded to the IOC by the international community in the development of the IOTWS **and called on** all relevant UN agencies, other organizations (including non-governmental) and donor agencies to actively collaborate with the IOC to develop the IOTWS. **The Assembly thanked** in particular WMO and ISDR for their ongoing and active collaboration with IOC **and called on** these Organizations to continue their collaboration.

293           **The Assembly thanked** the Government of Australia for its kind offer to host the Secretariat of the IOTWS and the First Session of the ICG/IOTWS in Perth, Australia, **and accepted** the offer.

294           **The Assembly thanked** the Government of India for offering to host the Second Session of the ICG/IOTWS in Hyderabad, India, **and accepted** the offer.

295           **The Assembly thanked** the many donors that have provided support for the development of the IOTWS at the bilateral level as well as to the IOC **and invited** them to continue this assistance until the system is well entrenched in national policies, and capacities have been built at the national and regional levels in a geographically balanced fashion that can be sustained and maintained by the participating Member States.

296           **The Assembly adopted** Resolution XXIII-12.

#### **4.8.2 IOC contribution to the establishment of a World Network of Tsunami Early-Warning Centres**

297           The Executive Secretary introduced this item. He recalled that, as early as the UN Conference on Small Island Developing States (Port Louis, 14 January 2005), countries had stressed the need to address the tsunami disaster in a global framework, and that a proposal for the establishment of a tsunami warning system had been formulated by IOCARIBE and endorsed by the Assembly in the past. The International Tsunami Warning System in the Pacific (ITSU) does not cover the marginal seas of the Pacific, in particular the South China Sea, or the southwest Pacific region. He urged the Assembly to fill these important gaps.

298           The International Conference for the Development of a Tsunami and Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (Mexico City, 1–3 June 2005) called on IOC to establish a Tsunami and Coastal Hazards Warning System for the Caribbean and Adjacent Regions and an Intergovernmental Coordination Group to oversee the development of the system.

- 299 The Executive Secretary also noted that WESTPAC, at its sixth Session (Nha Trang, Viet Nam, 23–27 May 2005) considered the establishment of a tsunami warning and mitigation system for the South China Sea.
- 300 The Executive Secretary stressed the fact that tsunami risks exist in all oceans to different degrees, and that tsunamis were caused not only by earthquakes but also by volcanic eruptions, landslides, underwater slumps, etc. It was therefore appropriate to be vigilant and prepared in all regions of the world.
- 301 The Representative of UN/ISDR recalled that the UN Flash Appeal project has promoted an overall integrated framework for strengthening early-warning systems in the Indian Ocean region, primarily for tsunamis, but also recognizing the context of multiple hazards, risk management and risk reduction. He stressed that risk reduction was a keystone of the Hyogo Framework for Action (HFA), 2005–2015, which was agreed by governments at the World Conference on Disaster Reduction (Kobe, Japan, January 2005). The HFA was designed to be integrated into various sectors of governments and organizations as actual policy so that disaster-risk reduction, including through tsunami early-warning systems, will be sustainable. A multiple and multi-disciplinary approach was therefore considered inevitable. He also recalled that the UN Secretary-General, Kofi Annan, had mentioned the urgent need for a Global Early Warning System, during the SIDS meeting in Mauritius in January this year. This was not only for the tsunami warning system but all other hazards. He reaffirmed ISDR's support for a multi-hazard approach.
- 302 China reported that it is considering initiating a multi-hazard early-warning system focusing on tsunamis and storm surges in adjacent ocean and seas, including the South China Sea. In this context, China expressed its interest in cooperating with other countries, as well as relevant organizations, to promote the development of this system under the coordination of IOC within a global framework.
- 303 Japan informed the Assembly that the Northwest Pacific Tsunami Information Centre (NWPTIC) had started to provide information to the countries in the concerned region of the northwestern Pacific Ocean from March 2005, and was currently upgrading its system to include the South China Sea and that this service would be available as from March 2006.
- 304 The United States of America recalled that, since the adoption of Resolution IV-6, in 1965, the United States of America had supported the activities of the International Tsunami Information Center (ITIC) as part of the International Tsunami Warning System in the Pacific (ITSU). The services of the ITIC, addressing all aspects of tsunami warning and mitigation, including hazard assessment, warnings, preparedness and research through a system of international cooperation and coordination of activities, are therefore more essential after the tragic events of 26 December 2004. It was therefore timely to reinvigorate this partnership and its services to the international community in the light of the IOC's catalytic leading role in creating a global tsunami warning system, by formally creating an IOC Programme Office for the International Tsunami Information Center (ITIC). The USA therefore recommended that ITIC be re-established as a Programme Office of IOC and that formal arrangements to this effect be put to the consideration of the IOC Executive Council at its 39th Session, in 2006. Until such an arrangement was made, the USA would continue to support the ITIC under the existing structure.
- 305 Australia informed the Assembly that it would be upgrading and putting in place new observing systems relevant to monitoring tsunamis throughout the southwest Pacific as part of an AU\$12 million programme over four years, and that it would provide an amount of AU\$2

million over four years to assist countries in the southwest Pacific to identify capacity-building needs in a multi-hazard disaster warning and mitigation framework. The activity will be implemented through cooperation with Pacific Island partners and SOPAC. This matter will also be submitted for discussion at the upcoming 20th Session of the ICG/ITSU.

306 Ecuador pointed out that vandalism was an important problem for buoys and constitutes a major challenge when maintaining an observation network and requested that IOC could play a role in obtaining insurance coverage for these instruments. Ecuador has considerable experience in this area which it offered to share with other Member States.

307 Canada informed the Assembly that it had recently completed a plan for a western Atlantic tsunami warning system, and expected this plan to be implemented in a timely fashion in collaboration with the USA. This system is being set up as a subset of an integrated all-hazards, tsunami and storm-surge warning system. Although lower than in the Pacific, there is a real risk of tsunamis in the northwest Atlantic, from submarine landslides and from other distant sources.

308 The Representative of SOPAC informed the Assembly that tsunamis are a significant hazard for the Pacific Islands, with many of the islands being close to tectonic-plate boundaries, hence experiencing local tsunamis relatively frequently. Few of the tsunamis are high enough to cause significant casualties or damage, however, although both Papua New Guinea and Vanuatu have suffered fatalities and severe damage in areas close to earthquake epicentres in the last ten years. Atoll islands throughout the region are vulnerable to oceanic tsunamis, but fortunately most are protected from significant impact by their fringing reefs. Besides the tsunami hazard, the region is also vulnerable to other natural hazards, such as tropical cyclones with associated storm surges, flooding and landslides, as well as drought and volcanic eruptions, with increasing numbers of social, biological and environmental hazards being added.

309 The Representative of SOPAC expressed her Organization's appreciation to IOC for its exemplary effort to establish a global network of tsunami early-warning centres and recommended IOC and other partners to collaborate in the development of the southwest Pacific's end-to-end multi-hazard warning system. The Pacific Region has been developing, through SOPAC, a Framework for Action for the period 2005–2015 entitled "An Investment for Sustainable Development in Pacific Island Countries. Disaster Risk Reduction and Disaster Management: Building the Resilience of Nations and Communities to Disasters." Effective, integrated and people-focused early-warning systems are one of the six framework principles for which clear regional and national priority initiatives have been identified and articulated. It is hoped that the framework will receive political endorsement by Pacific Leaders at the next Pacific Forum, to be convened in October 2005. SOPAC has also recently completed a baseline survey of Hazard Warning and Disaster Response Systems for Pacific Island States to identify gaps and niche areas. This was in response to a Commonwealth Secretariat request to seek advice from experts on the ways in which enhanced coordination would benefit Small Island States in mitigating the impacts of disasters through disaster warning and response systems. This information also responds to a request of the United Nations General Assembly calling on the ISDR Secretariat to conduct a survey of existing capabilities and gaps in worldwide early warning systems.

310 SOPAC is organizing a planning meeting in early September 2005 in Fiji to coordinate activities of partners contributing to the enhancement of an end-to-end multi-hazard early-warning system for the southwest Pacific. This meeting will provide an opportunity for more detailed planning of activities between Australian organizations, Pacific Island States, SOPAC and other partners under Australia's allocated resources to the region. In addition to this,

Australia has also recently announced its intention to fund the fourth phase of the longstanding South Pacific Sea-Level and Climate Monitoring Project. The SEREAD capacity-building project implemented by PI-GOOS is currently developing a teaching module for primary and secondary schools in the Pacific Islands region on preparedness and awareness related to tsunamis and natural hazards.

311 The Chairman of the ICG/ITSU, François Schindelé, strongly urged the Member States in all ocean and seas to establish interim systems as soon as possible. The process used in the Indian Ocean could be followed in other regions, such as the Caribbean; the PTWC can send tsunami advisory information to Member States in those regions. What is needed is for these Member States to identify 24/7 interim national focal points or an organization that will be responsible for the transmission of warning messages to relevant national authorities. However, the tsunami arrival time in the Caribbean region is very short, i.e. 10–60 minutes, which will require a very dense sea-level-station network to provide sufficient response time. The Chairman of the ICG/ITSU offered the expertise of the ICG/ITSU Member States to assist in the development of the new systems.

312 **The Assembly stressed** the need to avoid excessive fragmenting of IOC's tsunami-related and observation programme activities and called for the strong coordination of all IOC observing systems and related programmes under the new MLA (Developing operational capabilities for the management and sustainable development of the open and coastal ocean).

313 **The Assembly further instructed** JCOMM to facilitate the implementation of this integrated strategy.

314 **The Assembly noted** that the 26 December 2004 tsunami had changed the geomorphology of the coasts of several Indian Ocean countries. Some of these areas, at the onset of the monsoon season, had suffered from frequent coastal flooding, thereby adding to the damage and suffering already caused by the tsunami. **The Assembly called on** the Executive Secretary to organize, as part of the Tsunami Programme, bathymetric studies to identify areas vulnerable not only to tsunamis but also to this new challenge.

315 **The Assembly agreed** that it was important that immediate action be taken to establish a warning system and an associated intergovernmental coordination group for tsunami and other coastal hazards for the Caribbean and adjacent regions.

316 **The Assembly adopted** Resolution XXIII-13.

317 **The Assembly further agreed** that it was important that immediate action be taken to establish a tsunami early-warning and mitigation system and an associated intergovernmental coordination group for tsunamis in the northeastern Atlantic, the Mediterranean and connected seas.

318 **The Assembly adopted** Resolution XXIII-14.

319 **The Assembly stressed** the need for the IOC to address tsunami warning and mitigation in a global framework and as part of a multi-hazard approach.

320 **The Assembly adopted** Resolution XIII-15.

321 **The Assembly further recommended** that the IOC conduct an urgent study of the needs for such systems in all oceans and seas, in particular the western Atlantic, the central eastern

Atlantic, the Caspian Sea, the southwest Pacific, and the South China Sea, **and agreed** to implement interim systems in all these regions as soon as possible.

322 **The Assembly decided** to consider the governance of such additional systems during the next Session of the IOC Executive Council **and instructed** the Executive Secretary to coordinate the preparation of relevant draft proposals by concerned Member States.

## 5. ADMINISTRATION AND MANAGEMENT

### 5.1 FINANCING AND OWNERSHIP OF IOC'S PROGRAMMES

323 The Chairman of the Sessional Programme and Budget Committee, Captain Javier Valladares (Argentina), Vice-chairman of IOC, introduced this item. He explained that, given the trend of regular reduction in the UNESCO contribution to the IOC budget, it is necessary to collectively reflect on possible future scenarios as a possible basis for the reformulation of the Commission's medium- and long-term plans. To start this process, the document "We Have a Problem" (IOC-XXIII/2 Annex 8) was prepared for the consideration of the Assembly at the present session. It assesses the overall funding of IOC, analyses the existing funding mechanisms and proposes new ones, including extra-budgetary contributions from Member States through a voluntary pledging system. Some of the options in the document could be implemented immediately as interim measures for the biennium 2006–2007, making use of existing financial regulations applicable to the IOC Special Account and to voluntary contributions from Member States. The Chairman of the Sessional Programme and Budget Committee referred particularly to paragraphs 17 and 24 of the above-mentioned document, dealing with the existing funding mechanisms in IOC (Special Account) and in UNESCO (i.e. the scheme available for the World Heritage Centre), and urged the Member States to provide guidance as to the most desirable option or options. He informed the Assembly of the Programme and Budget Committee's proposal to establish an intersessional Working Group to reflect on such options, with the aim of submitting a sound "business plan" to the Executive Council at its 39th Session and subsequently to the Assembly at its 24th Session.

324 The Executive Secretary provided additional information on the available administrative options and highlighted the increasing importance of extra-budgetary contributions to all UNESCO programmes. He emphasized that in many UNESCO Sectors the level of such contributions is considerably higher than that attained by IOC.

325 **The Assembly expressed** its appreciation of the work of the Vice-chairman in producing an extremely useful and thought-provoking working document.

326 Member States also pointed out that, while working on a new challenging, yet realistic 'business plan', the IOC should focus on its principal priorities, align its policies with those of UNESCO and elaborate quantifiable benchmarks to ensure programme performance evaluation, which will: (i) assist the programme implementation, (ii) help the prioritization and (iii) help attract Member States' governments by concentrating on important societal issues. They stressed the view that the IOC should remain an intergovernmental organization with functional autonomy within UNESCO.

327 While noting that the positive results of the audit of the IOC Special Account by the UNESCO Internal Oversight Section confirmed the maturity of the IOC accounting procedures, **the Assembly encouraged** the Secretariat to continue its efforts to ensure that all expenditures are made in an optimal, efficient and economic manner.

328 The Chairman reminded the Assembly that IOC now finds itself at an historical moment in its development. It is clear that the oceans and ocean-related issues are on the agenda of all national governments and of the United Nations. The question to be resolved is whether there is the political will for IOC to be used as a mechanism for addressing that challenge.

329 **The Assembly decided** to establish an intersessional Working Group under the chairmanship of the Vice-chairman, Captain Valladares. The Group will work through electronic means, to prepare a set of proposals on new funding mechanisms, based on the enquiry outlined in the following paragraph for consideration by the Assembly at its 24th Session, to strengthen the capacity of the Commission to meet its mandatory obligations in the medium and long terms.

## 5.2 DRAFT PROGRAMME AND BUDGET 2006–2007

330 The Chairman of the sessional Programme and Budget Committee, Captain Javier Valladares (Argentina), Vice-chairman of IOC, introduced this item. He gave a detailed account of the discussions at the meetings of the Programme and Budget Committee. The Committee decided not to accept the budget proposed by the Executive Secretary in document IOC-XXIII/2 Annex 3 rev. The criteria applied by the Committee to translate the general reduction of the IOC's regular budget to the different programmes were: (a) no budget reduction for staff (all posts); (b) flat-rate reduction for all programme activities (amounting to about 26%); (c) no priorities to be set until proper performance metrics are developed, agreed and applied. After describing the Programme and Budget proposed by the Programme and Budget Committee and the actual consequences at the programme level, the Chairman of the Committee introduced the proposal to create an *ad hoc* Open-ended intersessional Working Group to: (a) engage in collective reflection on possible future IOC scenarios which could be used to reformulate mechanisms and plans predicated on IOC mission priorities and on a consistent set of programme performance metrics; (b) report to Executive Council at its 39th Session; (c) define the outlines of the IOC Programme and Budget 2008–2009. To facilitate this process, the Executive Secretary was asked to: (a) prepare information on the expenditures in terms of activities, regions and other issues in the last decade; (b) issue a Circular Letter, with detailed schedules and deadlines relative to the 39th Session of the Executive Council, inviting Member States to participate in the Working Group; (c) promote discussions among the Member States through an *ad hoc* virtual (Internet) forum set up by the IOC Secretariat.

331 South Africa, supported by a number of African Member States, voiced concern about the fact that, despite a number of clear instructions from the UNESCO General Conference as far back as 1999 (as reflected in the approved 30 C/5) to implement the IOC's Plan of Action in order to develop national and regional scientific capacities to promote sustainable development, particularly in UNESCO priority groups of countries, Africa and the least developed countries, there has been no significant delivery to date. The current proposed budget for 2006–2007 does not reflect that priority either; the Delegate recalled that the Executive Board of UNESCO had decided in April 2005 that, since the Millennium Development Goals were not being achieved in Africa, UNESCO and its subsidiary bodies should refocus their efforts, programmes and resources to include a greater concentration on programmes in and for Africa. Although acknowledging the difficult budgetary situation of the Commission, this is clearly not reflected in the proposed budget for 2006–2007. Only one programme funded in the proposed budget focuses exclusively on Africa and that, for an amount of only 1.4% of the IOC regular budget. South Africa called for future activities and programmes to be re-oriented to focus on Africa, and IOC staffing and results should reflect the prioritization of Africa.

332 In response, the Executive Secretary informed the Assembly that the two recruitment procedures used by IOC in the past biennium resulted in African professionals being shortlisted

(posts for Head of the Operational Observing Systems and Head of the Capacity-building Sections). In agreement with UNESCO's rules of recruitment, the evaluation panels were composed with an adequate balance of regions, including African staff members on the panels. This procedure did not, however, result in an African professional joining the Commission. He assured the Assembly that, for future recruitment, the same procedures will continue to apply, in compliance with the existing rules of UNESCO, assuring to all nationals an equitable recruitment procedure when applying for IOC positions.

333           **The Assembly expressed** its appreciation of the work done by the Programme and Budget Committee, under the Chairmanship of Captain. J. Valladares, **and approved** the principles proposed by the Committee.

334           Several Delegates expressed their willingness to participate in the *ad hoc* Open-ended Working Group.

335           **The Assembly adopted** Resolution XXIII-16.

### 5.3 ELECTIONS OF THE OFFICERS OF THE COMMISSION AND MEMBERS OF THE EXECUTIVE COUNCIL

336           The Chairman of the Nominations Committee, Dr Peter Koltermann, introduced this item. He informed the Assembly that all the nomination forms it had received were valid and had therefore been forwarded to the Assembly as document IOC-XXIII/NOM-WP.3 rev. Subsequently, there were two changes: (i) Tunisia withdrew its candidacy for Vice-chairpersonship (Electoral Group V), so that Tunisia consequently became a candidate for election to the Executive Council; and (ii) Uruguay withdrew its candidacy from the election to the Executive Council (Electoral Group III).

337           **The Assembly noted** that: (i) The Czech Republic, Kazakhstan and Serbia-and-Montenegro had joined the IOC since the 22nd Session of the Assembly; (ii) the present grouping of IOC Member States for the purpose of election to the Executive Council is in Annex VIII to this report; and (iii) the number and distribution of seats on the Executive Council had not changed since the 22nd Session of the Assembly.

#### 5.3.1 Election of the Chairperson of the Commission

338           **The Assembly noted** that there was only one candidate for the position of Chairperson. Prof. David T. Pugh (United Kingdom) was elected by acclamation.

#### 5.3.2 Election of the Vice-Chairpersons of the Commission

339           **The Assembly noted** that there was only one candidate from within each Electoral Group for the positions of Vice-chairperson. The following were therefore elected by acclamation:

Professor Mário Ruivo (Portugal)	Group I
Dr Alexander V. Frolov (Russian Federation)	Group II
C. de N. Javier A. Valladares (Argentina)	Group III
Dr Neville Smith (Australia)	Group IV
Dr Alfonse M. Dubi (United Republic of Tanzania)	Group V

### 5.3.3 Election of the Members of the Executive Council

340           **The Assembly noted** that there were nine candidates for the remaining Member State seats on the Executive Council for Electoral Group I, whereas the maximum number of those seats was nine (Rule of Procedure 18.2). The candidate Member States were therefore declared elected.

341           **The Assembly noted** that there was one candidate for the remaining Member State seats on the Executive Council for Electoral Group II. The candidate Member State was therefore declared elected.

342           **The Assembly noted** that there were eight candidates for the remaining Member State seats on the Executive Council for Electoral Group III, which was the maximum number of those seats. The candidate Member States were therefore declared elected.

343           **The Assembly noted** that there were nine candidates for the remaining Member State seats on the Executive Council for Electoral Group IV, whereas the maximum number of those seats was eight. A vote had therefore to take place to elect the Member States from Electoral Group IV to the Executive Council.

344           **The Assembly noted** that there were eight candidates for the remaining Member State seats on the Executive Council for Electoral Group V, which was the maximum number of those seats. The candidate Member States were therefore declared elected.

345           After a ballot to elect the representatives to the Executive Council from Electoral Group IV, the following Member States of this Group were elected: China, India, Indonesia, Japan, Malaysia, Republic of Korea, Sri Lanka and Thailand.

346           The list of Member States of the Commission and the composition of the Executive Council, are given in Annex VIII.

### 5.4 DATES AND PLACES OF THE TWENTY-FOURTH ASSEMBLY AND THE THIRTY-NINTH AND FORTIETH SESSIONS OF THE EXECUTIVE COUNCIL

347           The Executive Secretary introduced this item. The Executive Council, at its 38th Session (20 June 2005), confirmed the dates of its 39th Session: from Wednesday 21 June to Tuesday 27 June 2006 or Wednesday 28 June, leaving the final decision to the Officers and the Executive Secretary, taking into account the Provisional Agenda for the 39th Session. In 2007, the Executive Council will act as the Steering Committee for the 24th Session of the Assembly and will meet during half a day on Monday 18 June 2007 preceding the opening of the 24th Session of the Assembly, which will take place from Tuesday 19 June to Thursday 28 June 2007.

### 5.5 THEMES OF THE NEXT BRUUN AND PANIKKAR MEMORIAL LECTURES

348           The Executive Secretary introduced this item. He explained that the choice of the themes of the three series of IOC Memorial Lectures (Bruun, Panikkar and Revelle) should guarantee an adequate balance between regional priorities and technical and scientific issues and priorities.

349           The Chairpersons of the scientific, technical and regional IOC Primary Subsidiary Bodies were called upon to submit proposals on the themes and lecturers to be presented to the Assembly, a system that has given good results and should be continued.



350 Canada proposed that one of the lectures scheduled during the Assembly in 2007 relate to the International Polar Year.

351 Venezuela proposed that “Carbon Retention in a Coloured Ocean” Project (CARIACO) could also be addressed in one of the forthcoming IOC Memorial Lectures.

352 **The Assembly adopted** the procedure, outlined above, for all IOC Memorial Lectures in the future. **It noted** the suggestions of Canada and Venezuela.

## 6. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT

353 The Chairman of the Technical Review Committee for Draft Resolutions, Mr Geoff Holland, presented his report to the Assembly; it is in Annex VII.

354 In the light of his report, **the Assembly instructed** the IOC Executive Secretary to review the procedure and guidelines for the preparation and adoption of the Resolutions of the IOC Governing Bodies, taking into account the current procedure in UNESCO and other related UN bodies and changes in the conduct of IOC meetings and documentation.

## 7. CLOSURE

355 The Executive Secretary made a declaration to the plenary in the presence of the press. It is in Annex III-C.

356 The Chairman made a short closing address. It is in Annex III-D.

357 The Chairman closed the 23rd Session of the IOC Assembly at 13.00 on 30 June 2005.



ANNEX I

**AGENDA**

- 1. OPENING**
- 2. ORGANIZATION OF THE SESSION**
  - 2.1 ADOPTION OF THE AGENDA
  - 2.2 DESIGNATION OF THE RAPPORTEUR
  - 2.3 ESTABLISHMENT OF INTRASESSIONAL COMMITTEES
  - 2.4 INTRODUCTION OF DOCUMENTATION AND TIMETABLE
  - 2.5 ANTON BRUUN AND N.K. PANIKKAR MEMORIAL LECTURES
- 3. STATUTORY REPORTS**
  - 3.1 STATEMENT OF THE CHAIRPERSON ON THE STATE OF IOC  
[Rule of Procedure No.8.1.(a)]
  - 3.2 REPORT BY THE EXECUTIVE SECRETARY ON PROGRAMME  
AND BUDGET IMPLEMENTATION (2003–2005)  
[Rule of Procedure No.8.1.(b); Rule of Procedure No.49.1]
  - 3.3 PRESENTATION BY THE EXECUTIVE SECRETARY OF THE DRAFT  
PROGRAMME AND BUDGET FOR THE BIENNIUM 2006–2007  
[Rule of Procedure No.8.1.(c)]
  - 3.4 REPORT ON ACTIVITIES OF THE IOC (2003–2004) FOR PRESENTATION  
TO THE 33<sup>RD</sup> GENERAL CONFERENCE OF UNESCO  
[Statutes Art. 3.2; Rule of Procedure No.49.2]
- 4. PROGRAMME MATTERS REQUIRING DECISIONS BY THE ASSEMBLY**
  - 4.1 GENERAL POLICY ISSUES
    - 4.1.1 The Global Earth Observation System of Systems (GEOSS)  
and its 10-year Implementation Plan: Report of the Executive Secretary  
on the Expected Role of the IOC Through its Programmes  
[Res. EC-XXXVII.2]
    - 4.1.2 Mauritius International Meeting to Review the Implementation of the  
Programme of Action for the Sustainable Development of Small Island  
Developing States (Barbados+10): Report of the Executive Secretary  
[Res. EC-XXXVII.1]
    - 4.1.4 Prioritized Follow-up of Key Recommendations of the External  
Evaluation  
[Rec. XXI, Item 4.4, para. 94; Dec. EC-XXXV, Item 3.3, para. 47]
  - 4.2 OCEAN SCIENCES SECTION
    - 4.2.1 IOC Ocean Sciences Section Overview  
[Rule of Procedure 21.2(c)]
    - 4.2.2 Sponsorship of the World Climate Research Programme  
[Rule of Procedure 21.2(c)]

- 4.2.3 Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms [Rule of Procedure No.48.3]
- 4.2.4 Terms of Reference and Status of the SCOR–IOC Advisory Panel on Ocean Carbon Dioxine [Rule of Procedure 21.2(c)]
- 4.2.5 The Census of Marine Life [Rule of Procedure 21.2(c)]
- 4.3 OCEAN SERVICES SECTION
  - 4.3.1 Progress Report on the Strategic Plan for Oceanographic Data and Information Management [Res. EC-XXXV.2; Rec. XXII, Item 4.3.1, para. 132]
  - 4.3.2 Eighteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) [Rule of Procedure No.48.3]
- 4.4 OPERATIONAL OBSERVING SYSTEM SECTION
  - 4.4.1 Terms of Reference of the Intergovernmental Committee for GOOS (I-GOOS), the GOOS Scientific Steering Committee (GSSC) and the GOOS Project Office (GPO): Consolidated Proposal [Res. XXI-7; Res. XXII-4 and Res. EC-XXXVII.6]
  - 4.4.2 Seventh Session of the Intergovernmental Committee for the Global Ocean Observing System (I-GOOS) [Rule of Procedure No.48.3]
  - 4.4.3 WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM): Report on Activities [Inst. XXII; Item 4.4.5; para. 241 & 242; Rule of Procedure No.48.3]
  - 4.4.4 Ocean Component of the GCOS Implementation Plan and GOOS contribution to COP-10 [Rules of Procedure 21.2(c)]
- 4.5 REGIONAL ACTIVITIES
  - 4.5.1 Concept Paper on the Modalities of Implementation of IOC Programmes in Regions [Inst. XXXVII, Item 4.5.3, para. 228]
  - 4.5.2 Sixth Session of the IOC Regional Sub Commission for the Western Pacific (WESTPAC): WESTPAC-VI Report [Rule of procedure No.48.3]
- 4.6 UN CONVENTIONS AND AGREEMENTS
  - 4.6.1 Fifth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE–LOS V): Report of the Chairman [Rule of procedure No.48.3]
  - 4.6.2 Appropriate IOC Internal Procedure Related to an Effective Use of Article 247 of the UN Convention on the Law of the Sea: IOC/ABE-LOS proposal [Res. XXII-12 and Rec. EC-XXXVII, Item 4.6.1, para. 237]

- 4.6.3 Criteria and Guidelines on the Transfer of Marine Technology: Dissemination and Implementation Report [Res. EC-XXXVII.8]
- 4.6.4 United Nations Oceans and Coastal Areas Network (UN-Oceans): Report on activities [Rule of Procedure 21.2(c)]
- 4.7 CAPACITY-BUILDING
  - 4.7.1 IOC Principle and Strategy for Capacity-building: Final Draft [Res. EC-XXXVII.9]
  - 4.7.2 Implementation Plan for the IOC Strategy for Capacity-building: Final Draft ; Guidelines on Best Practices in Capacity-building [Res. EC-XXXVII.9]
  - 4.7.3 IOC Plan for Capacity-building in Remote Sensing in Oceanography: Progress Report [Res. EC-XXXVII.10]
- 4.8 RESPONSE IN THE AFTERMATH OF THE 26 DECEMBER 2004 TSUNAMI IN THE INDIAN OCEAN
  - 4.8.1 Early Warning Systems: World Conference on Disaster Reduction (WCDR), Kobe, Japan — Conference Results [Rule of Procedure 21.2(c)]
  - 4.8.2 IOC contribution to the Establishment of a World Network of Tsunami Early-warning Centres [Rule of Procedure 21.2(c)]
- 5. ADMINISTRATION AND MANAGEMENT**
  - 5.1 FINANCING AND OWNERSHIP OF IOC'S PROGRAMMES [Rules of Procedure 21.2(c)]
  - 5.2 DRAFT PROGRAMME AND BUDGET 2006–2007 [Statutes Art. 1.2; Res. EC-XXXVII.11]
  - 5.3 ELECTIONS OF THE OFFICERS OF THE COMMISSION AND MEMBERS OF THE EXECUTIVE COUNCIL [Statutes Art. 6.B.5 and 7; Annex I to the Rules of Procedure]
    - 5.3.1 Election of the Chairperson of the Commission
    - 5.3.2 Election of the Vice-Chairpersons of the Commission
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  - 5.4 DATES AND PLACES OF THE TWENTY-FOURTH ASSEMBLY AND THE THIRTY-NINTH AND FORTIETH SESSIONS OF THE EXECUTIVE COUNCIL [Rules of Procedure No.4 and No.19.2]
  - 5.5 THEMES OF THE NEXT A. BRUUN AND N.K. PANIKKAR MEMORIAL LECTURES
- 6. ADOPTION OF RESOLUTIONS AND SUMMARY REPORT**
- 7. CLOSURE**



ANNEX II

**ADOPTED RESOLUTIONS**

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Resolution XXIII-1

**THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOSS)**

The Intergovernmental Oceanographic Commission,

**I**

**Recalling:**

- (i) that the IOC, in pursuing a mandate by the United Nations Conference on Environment and Development (UNCED) in 1992, has developed, in close cooperation with WMO and ICSU, full plans for the establishment of the Global Ocean Observing System (GOOS) and is now fully engaged in its implementation,
- (ii) the World Summit on Sustainable Development (WSSD) Plan of Implementation, particularly paragraph 132,
- (iii) IOC Resolution EC-XXXVII.2 *The Earth Observation Summit (EOS)*,

**Noting** the Resolution of the Third Earth Observation Summit held in Brussels on 16 February 2005, endorsing the Global Earth Observation System of Systems (GEOSS) 10-Year Implementation Plan, describing the fundamental elements of an Earth Observation System and its principal expected benefits to a broad range of user communities,

**Recognizing** the exceptional opportunity provided by the GEOSS 10-year Implementation Plan to define, at a high political level, firm resources for operational observation of the Earth, at the national and international levels, particularly for the observing systems for oceans, coastal areas, natural resources, ecosystems and natural and human-induced hazards,

**Recognizing further:**

- (i) that full implementation of GOOS requires the sustained operation of *in situ* and space-based systems that are being considered as an integral part of GEOSS,
- (ii) the relevance to GEOSS of IOC's programmes, experience and expertise, and the roles and responsibilities of other intergovernmental organizations,

**Calls on** the Members and Participating Organizations of GEO to ensure that GEOSS:

- (i) pursues the synergy of existing and planned international and national observing systems;
- (ii) recognizes the systems and programmes for ocean observations under the leadership of the IOC, and in particular, GOOS as a crucial component of the "system of systems";
- (iii) secures full and open exchange of observational data, consistent with relevant international instruments, national policies and legislation, and in particular, the IOC Oceanographic Data Exchange Policy;



**Encourages** Member States to:

- (i) ensure their national coordination for GEO/GEOSS is fully informed on existing and planned IOC ocean observation programmes;
- (ii) work with GEO to find ways of allocating the necessary funds for the ocean observation programmes of the Commission;

**Instructs** the IOC Executive Secretary:

- (i) to keep the GEO fully informed of the contribution of GOOS, as an essential component of GEOSS, and of other related IOC activities;
- (ii) to work closely with counterparts in other UN agencies and programmes to ensure an effectively coordinated role for the UN system in the planning and implementation of GEOSS;
- (iii) to report on these measures to the Executive Council at its 39<sup>th</sup> Session.

## II

**Noting** with appreciation the Communiqué on support for tsunami and multi-hazard warning systems in the context of the Global Earth Observation System of Systems (GEOSS), adopted at the Third Earth Observation Summit, which expressed its support for the coordinating activities of the IOC in the development of effective tsunami warning systems,

**Invites** the Members and Participating Organizations of GEO to support the expansion of capabilities to deal with multi-hazard and other types of disaster at relevant national, regional and international levels, taking into account the UN's International Strategy for Disaster Reduction, as well as plans to establish regional tsunami warning systems under IOC leadership;

**Instructs** the IOC Executive Secretary to keep the GEO fully informed of the coordinating efforts of IOC and other UN agencies for realizing an integrated multi-hazard warning system as an integral part of the GEOSS.

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Identified funding (2006–2007):      US\$ 20,000/year from MLA 3\*

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\* this funding depends on the approval of the IOC budget for 2006–2007 by the UNESCO General Conference at the level currently reflected in the draft 33 C/5 (Draft Programme and Budget for 2006–2007).

Resolution XXIII-2

**SEVENTH SESSION OF THE IOC INTERGOVERNMENTAL PANEL  
ON HARMFUL ALGAL BLOOMS (IPHAB)**

The Intergovernmental Oceanographic Commission,

**Having considered** the Executive Summary Report of the 7<sup>th</sup> Session of the IOC Intergovernmental Panel on Harmful Algal Blooms (IPHAB) and the Workplan for 2006–2007 adopted at the Session (IOC/IPHAB-VII/3),

**Accepts** the Report, including the four Resolutions and six Recommendations of IPHAB-VII;

**Decides** to act on the following Recommendations:

Recommendation IPHAB-VII.1: GEOHAB Development

**Urges** Member States to provide resources for the establishment of an International Programme Office for GEOHAB;

Recommendation IPHAB-VII.2: Assessment of the Potential Effect of Tsunamis on the Temporal and Spatial Changes in Ciguatera Occurrence

**Calls on** the IOC Executive Secretary to take this IPHAB Recommendation fully into account in IOC follow-up of the tsunami catastrophe of 26 December 2004 in the Indian Ocean;

Recommendation IPHAB-VII.5: HAB Workplan 2006–2007

**Endorses** the proposed HAB Workplan 2006–2007 within the limits of the relevant resources in the Regular Programme and of the extra-budgetary resources identified for this purpose;

Recommendation IPHAB-VII.6: Operation of the IOC Intergovernmental Panel on Harmful Algal Blooms

**Instructs** the IOC Executive Secretary to convene the 8th Session of the Panel prior to the 24th Session of the Assembly.

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Identified funding (2006–2007): US\$ 52,000 from MLA 1\*  
US\$ 543,000 from expected Extra-budgetary resources  
US\$ 370,000 from Extra-budgetary resources to be identified

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\* this funding depends on the approval of the IOC budget for 2006–2007 by the UNESCO General Conference at the level currently reflected in the draft 33 C/5 (Draft Programme and Budget for 2006–2007).

Resolution XXIII-3

**CENSUS OF MARINE LIFE**

The Intergovernmental Oceanographic Commission,

**Noting** the progress in the Census of Marine Life, a ten-year initiative over 2001–2010 to assess and explain the diversity, distribution, and abundance of marine life in the oceans,

**Recalling** the expression of support for the Census of Marine Life from the 33<sup>rd</sup> Session of the Executive Council and the instruction to the IOC Secretariat to develop an appropriate mechanism for IOC involvement in the Census,

**Recognizing** that scientists of Member States are taking an active part in the Census and that there are links to the Census through IODE and GOOS,

**Acknowledging** the Census of Marine Life as an important tool for the international community to gain information on marine life and as a provider of monitoring methods for marine life for GOOS,

**Urges** Member States, particularly those whose scientists are not already involved in the Census of Marine Life or in its Ocean Biogeographic Information System (OBIS) initiative, to support active participation, with a view to contributing to the achievement of the goals of the Census of Marine Life by 2010;

**Encourages** the integration of OBIS into the IODE;

**Instructs** the IOC Executive Secretary to report to the Executive Council at its 39th Session on: the potential of the major elements of the Census of Marine Life initiative (History of Marine Animal Populations—HMAP; Ocean Realm Field Projects, and the Future of Marine Animal Populations—FMAP) to contribute to the IOC Main Lines of Action, in particular Ocean Sciences and GOOS, as well as to other activities supported by IOC, such as the International Polar Year, and to further report to the Executive Council on the contributions that IOC Main Lines of Action are making to the Census of Marine Life effort.

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Identified funding: not applicable.

Resolution XXIII-4

**INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE  
(IODE)**

The Intergovernmental Oceanographic Commission,

**Recognizing** that global research, monitoring and observing programmes that are relevant to issues such as climate change, ecosystem dynamics and biodiversity, rely on multi-

disciplinary data management, according to internationally agreed standards for their processing, quality control and archival,

**Acknowledging** the increasing role of the IODE Programme and its data and information centres in global observational and operational programmes,

**Acknowledging further** the considerable achievement of the IODE Programme in building capacity in Member States, specifically through the development of Ocean Data and Information Networks (ODIN) and the related OceanTeacher training and education system,

**Welcomes** the opening of the IOC Project Office for IODE in Ostend, Belgium, and **thanks** the Government of Flanders for the considerable additional financial support for capacity-building activities at the Project Office related to oceanographic data and information management;

**Accepts** the Executive Summary Report of the IODE-XVIII Session, **endorses** the Recommendations contained therein, and **notes with appreciation** the outcome of the IODE Review;

**Decides to:**

- (i) promote the development of regional Ocean Data and Information Networks;
- (ii) task the IOC Secretariat to ensure that all IOC programmes include data management in their activities and that these are developed in close collaboration with IODE and taken into consideration in the planned IOC data-management strategy;
- (iii) revise the objectives of the IODE Programme, as detailed in the Annex to this Resolution;

**Urges** Member States to:

- (i) increase their participation in international oceanographic data and information exchange through the establishment and/or strengthening of national data and information management infrastructures;
- (ii) ensure that these facilities are closely involved in and utilized for the management of data obtained from national, regional or international ocean programmes and projects;

**Invites** Member States to assist in the implementation of the IODE-XVIII work plan through the provision of extra-budgetary funds and/or the secondment of experts to the IOC Secretariat and/or IOC Project Office for IODE.

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Identified funding (2006–2007):

UNESCO Regular Programme:	US\$ 124,300 for programme activities US\$ 120,000 for staff (ALD — Appointment of Limited Duration (ALD)— total required US\$ 200,000)
Extra-budgetary confirmed:	US\$ 1,261,800
Extra-budgetary requested:	US\$ 487,700 (of which 80,000 for ALD)

Annex to Resolution XXIII-4

**The IODE Objectives**

The Objectives of the IODE Programme shall be:

- (i) to facilitate and promote the exchange of all marine data and information including metadata, products and information in real-time, near-real-time and delayed mode;
- (ii) to ensure the long-term archival, management and services of all marine data and information;
- (iii) to promote the use of international standards and develop or help in the development of standards and methods for the global exchange of marine data and information, using the most appropriate information management and information technology;
- (iv) to assist Member States to acquire the necessary capacity to manage marine data and information and become partners in the IODE network; and
- (v) to support international scientific and operational marine programmes of IOC and WMO and their sponsor organizations with advice and data-management services.

Resolution XXIII-5

**TERMS OF REFERENCE OF THE INTERGOVERNMENTAL COMMITTEE FOR  
THE GLOBAL OCEAN OBSERVING SYSTEM (I-GOOS) AND THE GOOS  
SCIENTIFIC STEERING COMMITTEE (GSSC)**

The Intergovernmental Oceanographic Commission,

**Recalling:**

- (i) the decision of the IOC Assembly at its 21st Session (Resolution XXI-7) that a review of the organizational structure of GOOS be carried out by an external independent Review Group during 2002,
- (ii) the consideration of the Report of the GOOS Review Group (IOC/INF-1185) by the 22<sup>nd</sup> Session of the IOC Assembly,
- (iii) the decision of the 22<sup>nd</sup> Session of the IOC Assembly to create an open-ended Intersessional Working Group (Resolution XXII-4) of interested Member States and representatives of the GOOS-sponsoring organizations: to revise the Terms of Reference of the Intergovernmental Committee for GOOS (I-GOOS), the GOOS Scientific Steering Committee (GSSC) and the GOOS Project Office (GPO) accordingly; to develop a draft plan of action; and to present their findings to the IOC Executive Council at its 37<sup>th</sup> Session,
- (iv) the request of the 37<sup>th</sup> Session of the IOC Executive Council to re-examine the draft terms of reference of I-GOOS, the GSSC and the GOOS Project Office (GPO),

- (v) Resolution EC-XXXVII.6 and the subsequent invitation to Member States by IOC Circular Letter No. 2147 to submit further comments on the terms of reference and to seek the views of the three other co-sponsoring organizations (UNEP, WMO and ICSU),

**Confirms** that I-GOOS has the overall responsibility for promotion, planning and coordination of GOOS, and that the renamed GOOS Scientific Steering Committee (GSSC) has the responsibility for providing scientific and technical advice to I-GOOS;

**Agrees** that the operation of the GOOS Project Office is the responsibility of the IOC Executive Secretary;

**Decides** to amend the Terms of Reference of I-GOOS and the GSSC, as given in the Annex to this Resolution;

**Instructs** the IOC Executive Secretary to provide, in consultation with I-GOOS, a consolidated information document reflecting the conclusions of the GOOS Review Group (IOC/INF-1185) and subsequent decisions of the Executive Council and Assembly of IOC.

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Identified funding: not applicable

#### Annex to Resolution XXIII-5

### **Terms of Reference for I-GOOS and GSSC**

#### **1. The Intergovernmental Committee for the Global Ocean Observing System (I-GOOS)**

The Intergovernmental Committee for GOOS (I-GOOS), functioning under the Intergovernmental Oceanographic Commission (IOC) of UNESCO and with co-sponsorship from WMO and UNEP, has the overall responsibility for formulation of policy, principles and strategy, and for planning and coordination of GOOS.

I-GOOS will:

- (i) oversee the implementation of GOOS;
- (ii) assess regularly the performance of GOOS in meeting user requirements for information products and services;
- (iii) facilitate development of scientific and technical strategies as well as sound plans, through the advice of the GOOS Scientific Steering Committee;
- (iv) formulate policy and approve overall plans for the implementation of GOOS;
- (v) facilitate the implementation of such policy and plans through national and regional initiatives and subsidiary bodies of IOC, as appropriate, including consideration of the socio-economic benefits and the identification and mobilization of needed resources;
- (vi) review and assess the development and implementation of GOOS and recommend changes as required;

- (vii) assist in developing the capacity of all Member States to contribute to and benefit from GOOS and in particular aid countries to acquire and make best use of information products and services derived from GOOS;
- (viii) develop recommendations for the consideration of the sponsoring organizations on priority needs for GOOS development, coordination and implementation;
- (ix) promote international support and cooperation for implementation of GOOS, through other UN agencies and international mechanisms such as the Global Earth Observation System of Systems.

A Chair and four Vice-Chairs will be elected in accordance with the Statutes and Rules of Procedure of the IOC and will serve for a two-year term, extendable to a maximum of four years. The IOC Executive Secretary will provide secretariat support for I-GOOS.

I-GOOS shall meet at two-year intervals. The I-GOOS Board, consisting of the Chair and Vice-Chairs, as well as the Chair of the GSSC as an *ex-officio* member, shall provide guidance and advice on the implementation of the decisions of I-GOOS to the Chair during the intersessional period. The terms of reference for the I-GOOS Board will be decided by I-GOOS.

## **2. GOOS Scientific Steering Committee (GSSC)**

The GOOS Scientific Steering Committee (GSSC), composed of nominated experts in relevant disciplines of marine science and global observation, co-sponsored by IOC, WMO, UNEP and ICSU, has the responsibility to provide scientific and technical advice to I-GOOS, the intergovernmental body responsible for GOOS.

GSSC will:

- (i) advise the I-GOOS on all scientific and technical aspects of GOOS, as well as on the resource requirements;
- (ii) develop and update, as appropriate, a long-term scientific and technical plan and accompanying short- to medium-term action plans and targets for GOOS;
- (iii) be responsible for the scientific and technical aspects of GOOS design and operation, and undertake appropriate activities to support the design process;
- (iv) submit, as required, reports to the sponsoring organizations and to I-GOOS;

The GSSC may establish technical advisory groups as appropriate.

The GSSC shall comprise (a) scientific and technical experts (up to a maximum of 18, selected by the sponsoring organizations as specified in the Memorandum of Understanding on GOOS, after consultation with Member States), taking into account balanced regional representation and selected on the basis of their personal expertise, so as to provide a balanced representation of the major scientific and technical disciplines and of the major operational and research programmes, including users, industry, governments and policy-makers, contributing to GOOS; (b) one representative of each of the GOOS sponsoring organizations; (c) the chairpersons of I-GOOS, JCOMM and IODE; (d) representatives of the other global observing systems. Individual experts may be invited as needed, including the chairs of the GSSC technical advisory groups. The Chair and a Vice-chair of GSSC will be chosen by the

sponsors from among the scientific and technical expert members of the GSSC.

GSSC shall meet annually until decided otherwise by the sponsors. The members are appointed for three-year terms. The IOC Executive Secretary will provide secretariat support for the GSSC.

Resolution XXIII-6

**REGIONAL COOPERATION IN MARINE SCIENCE AND TECHNOLOGY  
AND THE ROLE OF THE IOC REGIONAL SUBSIDIARY BODIES**

The Intergovernmental Oceanographic Commission,

**Recognizing that:**

- (i) the IOC has a long tradition in implementing regional programmes and the regional components of its global programmes through Regional Subsidiary Bodies, and that these activities must be maintained, at an appropriate level, if it is to retain its status as the only organization within the UN system concerned exclusively with ocean sciences and ocean services,
- (ii) UNESCO's policy of zero nominal growth is expected to continue in the foreseeable future, impacting the IOC regular budget and in consequence the Regional Subsidiary Bodies, and that concrete measures must be taken to maintain an appropriate balance between the Commission's ocean sciences, ocean services, and capacity-building programmes, as well as between global and regional activities,
- (iii) the role of Regional Subsidiary Bodies must be made more effective and efficient by examining and correcting the present deficiencies, improving communications and interactions and ensuring a comprehensive programme following the Commission's Main Lines of Action,

**Urges** Member States to increase the involvement of their national IOC contact points in the development of regional work plans;

**Encourages** the IOC Regional Subsidiary Bodies immediately to:

- (i) increase regional interactions, and improve coordination with organizations that have significant political and financial support, as well as those with an institutional mandate to promote scientific and technical advancement;
- (ii) identify the most urgent capacity-building requirements in their respective Member States and play an active role in the formulation of proposals to donor agencies;
- (iii) raise public awareness of the purpose and work of the IOC Regional Subsidiary Bodies;



**Further urges** Member States to accord priority status to ocean sciences and services in national and regional development and research programmes, and include them in their dialogue with the international donor/development community;

**Instructs** the IOC Executive Secretary to:

- (i) arrange a meeting of the regional Chairpersons in conjunction with each Assembly, so as to improve regional input to the work of the Assembly;
- (ii) schedule the meetings of the Regional Subsidiary Bodies, where possible, to be in phase with the IOC planning cycles;
- (iii) take into account, within a balanced IOC regular programme and budget, the needs of each Regional Subsidiary Body for biennial funding for regional coordination activities and for the mobilization of extra-budgetary resources for the Commission's regional activities;

**Further instructs** the IOC Executive Secretary to create an Intersessional Working Group, composed of the Chairpersons of Regional Subsidiary Bodies and involving all interested Member States, and conducting business through electronic means, to:

- (i) assess the present efficiency and effectiveness of the Commission's regional programmes using quantifiable indicators that consider the categories of core, extra-budgetary and leveraged funding, and the impact of results;
- (ii) assess the role of regional activities in the long-term plans of the Commission and prepare a realistic scenario of the resources required in the immediate, medium and long term; and
- (iii) report on progress to the Executive Council at its 39<sup>th</sup> Session;

**Requests** the Executive Council, at its 39th Session, to consider the report on the progress of the Intersessional Working Group and reflect the results as appropriate in the IOC Medium-term Strategy 2008–2013.

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Identified funding: not applicable.

Resolution XXIII-7

**SIXTH SESSION OF THE IOC REGIONAL SUB-COMMISSION  
FOR THE WESTERN PACIFIC (WESTPAC)**

The Intergovernmental Oceanographic Commission,

**Acknowledging** the substantial benefits to Member States from IOC programme and project implementation in the western Pacific region during the intersessional period 2002–2005,

**Recognizing:**

- (i) the urgent need to sustain and enhance those benefits and ensure effective delivery of products and services to Member States and other stakeholders in the future,
- (ii) the renewed interest and collaboration of Member States, international and national, governmental and non-governmental organizations in the activities of the Sub-Commission,

**Noting** the Document IOC-XXIII/2 Annex 5 on "Enhancing the Effectiveness of Regional Cooperation in Marine Science and Technology and the Role of the IOC Regional Subsidiary Bodies" presented at the 23<sup>rd</sup> Session of the Assembly,

**Expresses** its gratitude and appreciation to the Government of Viet Nam for hosting the 6<sup>th</sup> Session of the IOC Sub-Commission for the Western Pacific, held in Nha Trang, 23–27 May 2005;

**Accepts** the WESTPAC-VI Executive Summary Report, and **endorses** two Resolutions;

**Instructs** the IOC Executive Secretary to take the necessary action;

**Urges** Member States and donor agencies:

- (i) to participate actively and to provide extra-budgetary funds and other means in order to implement the priority WESTPAC programmes and projects; and
- (ii) to support, through financial and other means, the activities spelled out in the WESTPAC Strategy and Implementation Plan for Capacity-building;

**Invites** other international and regional organizations, programmes, and projects to continue and/or renew their commitments to and partnerships with WESTPAC.

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Identified funding (2006–2007):      US\$ 20,000 from MLA 3\*  
                                                            US\$ 400,000 from Extra-budgetary to be identified

Resolution XXIII-8

**FIFTH MEETING OF THE IOC ADVISORY BODY OF EXPERTS  
ON THE LAW OF THE SEA (IOC/ABE-LOS V)**

The Intergovernmental Oceanographic Commission,

**Noting with satisfaction** the progress made by the IOC Advisory Body of Experts on the Law of the Sea at its 5th Session, which was held in Buenos Aires from 11 to 15 April 2005,

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\* This funding depends on the approval of the IOC budget for 2006–2007 by the UNESCO General Conference at the level currently reflected in the draft 33 C/5 (Draft Programme and Budget for 2006–2007).

**Bearing in mind** the UNGA Resolution 59/24 and the IOC Resolutions XXII-12 and EC-XXXVII-8 which stated mandates with respect to the work of IOC/ABE-LOS on:

- (i) the practice of Member States with respect to Parts XIII and XIV of UNCLOS,
- (ii) the dissemination and implementation of the *Criteria and Guidelines on the Transfer of Marine Technology*,
- (iii) the Procedure for the application of Article 247 of the United Nations Convention on the Law of the Sea by the Intergovernmental Oceanographic Commission of UNESCO,
- (iv) the IOC legal framework within the context of UNCLOS which is applicable to the collection of oceanographic data,

**Expressing its appreciation** of the IOC publication on the Criteria and Guidelines on the Transfer on Marine Technology;

**Accepts** the Report of IOC/ABE-LOS V and **endorses** the recommendations contained in the Report;

**Adopts** the "Procedure for the application of Article 247 of the United Nations Convention on the Law of the Sea by the Intergovernmental Oceanographic Commission", annexed to this Resolution;

**Encourages** the IOC/ABE-LOS to keep working on the legal framework for the collection of oceanographic data within the context of UNCLOS in close cooperation with I-GOOS and UN-DOALOS, and to propose practical guidelines for the conduct of the following activities:

- (i) the deployment of floats on high seas which may drift into EEZs;
- (ii) the deployment of floats and surface drifting buoys in EEZs;
- (iii) the deployment of XBTs by ships of opportunity in EEZs; and
- (iv) to report to the Executive Council at its 39<sup>th</sup> Session;

**Urges** Member States to increase financial support for the organization of IOC/ABE-LOS VI, in addition to the regular programme funds already allocated.

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Identified funding: US\$ 17,000 from MLA 3 for the organization of IOC/ABE-LOS VI session in 2006.

Annex to Resolution XXIII-8

**Procedure for the Application of Article 247  
of the United Nations Convention on the Law of the Sea  
by the Intergovernmental Oceanographic Commission of UNESCO**

1. This Procedure will apply to a marine scientific research project governed by the provisions of Part XIII of the UN Convention on the Law of the Sea ("the Convention")

which the Intergovernmental Oceanographic Commission (“the Commission”) wants to carry out in accordance with Article 247 of the Convention.<sup>1</sup>

2. The Assembly hereby establishes, in accordance with the Commission’s Statutes and Rules of Procedure, an advisory body for the application of this procedure (the Advisory Body for the application of Article 247 of the United Nations Convention on the Law of the Sea by the Commission, the “Advisory Body”). All IOC Member States are entitled to participate in the work of the Advisory Body.
3. An initiative by one or more IOC Member States to submit a proposal that the Commission undertake a marine scientific research project under Article 247 of the Convention shall be referred by the Executive Secretary to the Advisory Body. The Executive Secretary shall ensure that all Member States in whose exclusive economic zone (“EEZ”) or on whose continental shelf such project is to be carried out, or otherwise to be involved in the execution of the project, shall be appropriately and timely notified and be invited to participate in the discussion of the proposed project within the Advisory Body.
4. The Advisory Body shall make a recommendation to the Assembly as to whether or not the proposed project should be carried out. A positive recommendation by the Advisory Body that the Commission undertake the proposed project shall be submitted to the Assembly in the form of a draft resolution. To the draft resolution shall be annexed a detailed description of the project containing the information referred to in Article 248 of the Convention and the proposed ways to comply with the conditions set out in Article 249 of the Convention.
5. A decision that the Commission undertake a marine scientific research project under Article 247 of the Convention shall be taken by the Assembly by means of the adoption of a resolution. The draft for such a resolution, together with the Annex referred to in paragraph 4, shall be communicated to all Member States at least two months in advance of the starting date of the meeting of the Assembly, and shall explicitly indicate that its adoption is for the purpose of applying Article 247 of the Convention.
6. If it is deemed necessary for an effective execution of the proposed project, the Assembly will be convened, in accordance with the Rules of Procedure of the Commission, in an extraordinary session for the purpose of the adoption of the resolution. Such session can only be held if the conditions of paragraphs 3 and 4 are respected.
7. Subject to paragraphs 8 and 9, a project shall not be carried out in the EEZ or on the continental shelf of a Member State unless that State has voted in favour of the resolution referred to in paragraph 5 or has otherwise expressed its willingness to

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<sup>1</sup> Article 247 of the UN Convention on the Law of the Sea reads as follows:  
“A coastal State which is a member of or has a bilateral agreement with an international organization, and in whose exclusive economic zone or on whose continental shelf that organization wants to carry out a marine scientific research project, directly or under its auspices, shall be deemed to have authorized the project to be carried out in conformity with the agreed specifications if that State approved the detailed project when the decision was made by the organization for the undertaking of the project, or is willing to participate in it, and has not expressed any objection within four months of notification of the project by the organization to the coastal State.”

participate in the project as described in the Annex to the resolution prior to the notification referred to in paragraph 8.

8. The IOC Executive Secretary shall provide notification through appropriate official channels to each Member State in whose EEZ or on whose continental shelf the research project is to be carried out as soon as possible after the adoption of the resolution, but no later than six months in advance of the actual starting date of the project in the EEZ or on the continental shelf. The notification shall include the text of the adopted resolution and its Annex.
9. The research activities may be commenced in the EEZ or on the continental shelf of a Member State six months after the receipt of the notification referred to in paragraph 8 by the Member State if no objection has been communicated by such State to the IOC Executive Secretary within four months of the receipt of that notification.
10. In case of a marine scientific research project under Article 247, part of which is planned to be carried out in the EEZ or on the continental shelf of a coastal State which is not a Member of the Commission, bilateral negotiations may be initiated by the Commission with the coastal State in question, with a view to concluding an agreement on the conditions under which the research activities may be carried out in those maritime zones. The coastal State shall be invited to contribute to the discussion of the project before its submission to the Assembly. The part of the project concerning such a coastal State may be only carried out if the referred agreement, including in the Annex to the resolution corresponding to the project, has been concluded between the coastal State and the Commission, in conformity with the Statutes and Rules of Procedure of the Commission. In that event, paragraphs 8 and 9 of the present procedure will apply.
11. Nothing in this Procedure shall prejudice the rights, jurisdiction and duties of States under the international law of the sea, in particular the Convention. This Procedure shall be interpreted in the context of and in a manner consistent with the provisions of the Convention.

#### Resolution XXIII-9

### **IOC CRITERIA AND GUIDELINES ON THE TRANSFER OF MARINE TECHNOLOGY**

The Intergovernmental Oceanographic Commission,

**Recalling** the adoption by the Assembly at its 22<sup>nd</sup> Session of the Criteria and Guidelines on the Transfer of Marine Technology, through IOC Resolution XXII-12,

**Noting** that the UN General Assembly at its 59<sup>th</sup> Session, in paragraph 11 of its Resolution on the Oceans and the Law of the Sea (A/RES/59/24), encouraged IOC to continue to disseminate and implement the referred Criteria and Guidelines,

**Considers** that the Criteria and Guidelines have not yet been fully implemented;

**Urges** Member States to fully implement these Criteria and Guidelines;

**Instructs** the IOC Executive Secretary to fulfil his responsibilities under the Criteria and Guidelines, and to report on progress to the Executive Council at its 39<sup>th</sup> Session.

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Identified funding: not applicable.

### Resolution XXIII-10

## **IOC PRINCIPLES AND STRATEGY FOR CAPACITY-BUILDING**

The Intergovernmental Oceanographic Commission,

**Noting** Resolution EC-XXXVII.9, requesting the IOC Executive Secretary to produce a final draft Strategy for Capacity-building, based on comments received from Member States on the original draft presented, and in response to IOC Circular Letter No. 2119,

**Noting further** the high priority to be given to the use of GOOS components to address regional concerns,

**Endorses** the Principles and Strategy for Capacity-building given in document IOC/INF-1211 prov.;

**Instructs** the IOC Executive Secretary to:

- (i) conduct regional assessments of existing capacities to undertake marine scientific research and operational oceanography in accordance with the Principles and Strategy for Capacity-building;
- (ii) pursue and secure new sources of funding and human resources support for the implementation of the Commission's Strategy for Capacity-building.

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Identified funding (2006–2007): US\$ 20,000 from MLA 3\*  
US\$ 92,000 from Extra-budgetary resources for staffing and liaison to be identified  
US\$ 300,000 from Extra-budgetary resources (US\$ 50,000 each for IOCARIBE, IOCEA, IOCWIO, IOCINDIO, WESTPAC & Black Sea) for baseline assessments

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\* This funding depends on the approval of the IOC budget for 2006–2007 by the UNESCO General Conference at the level currently reflected in the draft 33 C/5 (Draft Programme and Budget for 2006–2007).



Resolution XXIII-12

**INTERGOVERNMENTAL COORDINATION GROUP FOR THE INDIAN OCEAN  
TSUNAMI WARNING AND MITIGATION SYSTEM**

The Intergovernmental Oceanographic Commission,

**Extending** its deepest sympathies and condolences to the victims of the Indian Ocean tsunami of 26 December 2004, their families, the people and governments of the countries affected, and **expressing** its deepest concern over the negative economic, social, psychological, environmental and other consequences and impacts of the tsunami disaster,

**Recalling:** the many directions and guidance provided by: the Special ASEAN Leaders' meeting adopted in Jakarta on 6 January 2005; the UN Conference on Small Island Developing States held in Port Louis, Mauritius, from 10 to 14 January 2005; the UNGA Resolution 59/279 adopted in New York on 19 January 2005; the Common Statement of the Special Session on Indian Ocean Disaster and the Hyogo Framework for Action 2005–2015, both adopted at the World Conference on Disaster Reduction in Kobe on 22 January 2005; the Ministerial Declaration in Phuket adopted on 29 January 2005; the GEO Communiqué adopted in Brussels on 16 February 2005; and the technical meetings held in India, China and Indonesia,

**Recognizing** the unique tectonic plate structure of the Indian Ocean and that there are primarily two tsunamigenic sources that could affect the coastlines of the Indian Ocean, namely the Indonesian seismic zone and its extensions, about 4000 km in length, and the Makran source,

**Reaffirming** that the Indian Ocean Tsunami Warning and Mitigation System (IOTWS) will be a coordinated network of national systems and capacities, and will be part of a global network of early-warning systems for all ocean-related hazards,

**Reaffirming** further that each Member State should have the responsibility to issue warnings within their respective territories,

**Recalling** its commitment to an open, free and unrestricted sharing of tsunami-relevant real-time observational data in accordance with the UNESCO/IOC Oceanographic Data Exchange Policy and without prejudice to the sovereignty of Member States,

**Welcoming:**

- (i) the plans and intentions of Australia, India, Indonesia, Malaysia and Thailand to develop their national capability to detect, analyse and provide timely warning of tsunamis generated along the Indonesian seismic zone and its extensions as well as the plans of India, Iran and Pakistan to cover the Makran source,
- (ii) the plans and intentions of all countries of the Indian Ocean to enhance their abilities to receive tsunami advisory information and warnings and issue appropriate warnings within their respective territories on a twenty-four-hour/seven-day-a-week basis,



- (iii) the many generous offers of financial and technical assistance made by countries across the globe to help establish an IOTWS, particularly the contributions of Australia, Belgium, Canada, China, Finland, France, Germany, India, Italy, Japan, Norway, Sweden, United States of America and the European Union,
- (iv) the continuing support of the IOC/ITIC (International Tsunami Information Centre) to assist the ICG/IOTWS and its Secretariat in development of communications and capacity-building activities,
- (v) the fact that the Pacific Tsunami Warning Centre (PTWC) and the Japan Meteorological Agency (JMA) have started to provide interim tsunami advisory information to authorized contacts in the Indian Ocean States within and bordering the Indian Ocean,

**Emphasizing** the importance of the media in avoiding panic by responsibly reporting this information,

**Endorses** the Paris Communiqué (attached as Annex 2 to this Resolution) adopted on 8 March 2005 by the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework, held in UNESCO headquarters, and the Mauritius Declaration (attached as Annex 3 to this Resolution) adopted on 16 April 2005 by the Second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System, held in Grand Baie;

**Decides:**

- (i) to create an IOTWS and establish an Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), as a subsidiary body of IOC, with the final Terms of Reference attached as Annex 1 to this Resolution;
- (ii) that the IOC shall provide the Secretariat of the ICG/IOTWS;
- (iii) that the IOC shall develop a comprehensive programme of capacity-building on tsunami protection for the Indian Ocean, in order to assist all countries of the region, including the coastal African countries and Middle-Eastern countries, to have the capacity to protect their populations;

**Invites** Member States in the Indian Ocean region to submit to the IOC Executive Secretary, in writing and as early as possible, the name of the institution acting as the National Tsunami Warning Centre, or responsible for its development, and thus having responsibilities to officially receive tsunami-related information bulletins and warnings;

**Welcomes and accepts** the generous offer of Australia to (i) support the Secretariat of the ICG/IOTWS, which will be located within the IOC Perth Regional Programme Office; and (ii) provide ongoing and dedicated financial and other support for the Secretariat of the ICG/IOTWS;

**Invites** all Member States and other countries, international and regional organizations to provide financial, technical and other kinds of assistance for the establishment of the IOTWS,

including voluntary contributions to the IOC Trust Fund in order to assist the Commission in the effective provision of secretariat services for the ICG/IOTWS.

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Identified funding (2006–2007):        US\$ 50,000 from extra-budgetary resources  
                                                  to be identified

Annex 1 to Resolution XXIII-12

**Terms of Reference of the Intergovernmental Coordination Group  
for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS)**

The ICG will be established as a subsidiary body of the IOC and will report to, and seek guidance from, the IOC Assembly.

**Objectives:**

1. To coordinate the activities of the IOTWS;
2. To organize and facilitate as appropriate the exchange of seismic, sea level and other data at or near real-time and information required for the interoperability of the IOTWS;
3. To promote the sharing of experience and expertise related to tsunami warning and mitigation for the Indian Ocean basin;
4. To promote tsunami research;
5. To promote the establishment and further development of national tsunami warning and mitigation capacities in accordance with standard protocols and methods;
6. To develop, adopt and monitor implementation of work plans of the IOTWS, and to identify required resources;
7. To promote implementation of relevant capacity-building;
8. To liaise and coordinate with other tsunami warning systems;
9. To liaise with other relevant organizations, programmes and projects;
10. To promote the implementation of the IOTWS within a multi-hazard framework;
11. To keep under constant scrutiny the status of the system and how it satisfies the needs.

**The secretariat for the ICG/IOTWS shall:**

1. Support meetings of the ICG;
2. Facilitate the liaison among the various national contact points and national tsunami warning centres;
3. Maintain a current list of operational national contact points and facilities and make it available on request to all Member States;

4. Organize the liaison between ICG/IOTWS and the ICG/ITSU, with the PTWC and with other tsunami warning centres to facilitate best practices in tsunami warning;
5. Initiate and support training activities and enhance and enrich tsunami warning in the Indian Ocean.

**Membership of the ICG/IOTWS:**

- Member States of the IOC within and bordering the Indian Ocean
- Observers from other IOC Member States
- Invited observers from other organizations (including NGOs), programmes and projects, in accordance with the IOC rules and procedures.

Annex 2 to Resolution XXIII-12

**Communiqué of the First International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework and Draft Terms of Reference of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS)**

UNESCO, Paris, 3–8 March 2005

We, the participants at the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework held in Paris on 3–8 March 2005:

Recognizing that the recent Indian Ocean tsunami of 26 December 2004, considered to be one of the strongest in the world, resulted in devastations amounting to national calamities in the Indian Ocean. This has been the deadliest tsunami of all time by an order of magnitude, and has led to a call for action for the entire global community;

Recalling the direction and guidance provided by the Special ASEAN Leaders' meeting in Jakarta on 6 January 2005, the UN Conference on Small Island Developing States held at Port Louis on 14 January 2005, the UNGA Resolution 59/279 in New York on 19 January 2005, the *Common Statement of the Special Session on Indian Ocean Disaster* and the *Hyogo Framework for Action 2005–2015* both adopted at the World Conference on Disaster Reduction in Kobe on 22 January 2005, the Ministerial Declaration in Phuket on 29 January 2005, the GEO Communiqué in Brussels on 16 February 2005, and the technical meetings held in Indian and China;

Recognizing the need to develop a tsunami warning and mitigation system in the Indian Ocean with the purpose of enhancing all aspects of tsunami disaster mitigation, including hazard assessment, detection and warnings, preparedness, and research through international cooperation and coordination of activities;

Noting that, despite the infrequent occurrence of tsunamis in the Indian Ocean, tsunamis could occur at any time and can be very devastating as was the case on 26 December 2004. Therefore, to be effective, a tsunami warning and mitigation system for the Indian Ocean must be durable;

Noting it is important to improve the science of issuing tsunami warnings to reduce false alarms given the inordinate inconvenience and disruptions to normal life caused by false alarms, especially given the high population densities and intensive operations in coastal areas in the Indian Ocean, and also to continuously improve forecasting;

Recognizing that the impact of tsunamis can be substantially reduced through institutional and legislative frameworks as well as community participation, and that this requires that tsunami warnings must reach local communities by various means and be understood at all levels, so that people are well informed and motivated towards safety measures and actions;

Recognizing that national tsunami disaster mitigation programmes will benefit from partnerships between governmental institutions, the private sector and civil society organizations;

Recommend that the IOC Assembly establish, in accordance with its rules of procedures, an Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), which will govern the system. Such a group will be composed of interested IOC Member States from the Indian Ocean region. All the other Members of the IOC, as well as relevant concerned international and regional organizations, will be welcome to participate as observers;

Recommend that the IOC Secretariat act as the secretariat to the Intergovernmental Coordination Group for the IOTWS;

Agree that the IOTWS should consist of a coordinated network of national systems and capacities, and that all associated assets should be owned and operated by the Member States hosting or otherwise taking responsibilities for them;

Agree that the Member States should have the responsibility to have control over the issuance of warning within their respective territories;

Agree that the Member States build public awareness through education and capacity-building to ensure effective community awareness of the risks posed by tsunamis, so that their population is prepared for, and knows how to act in the event of a tsunami warning;

Recommend that, to facilitate durability, the IOTWS should utilize or build on, where possible, existing organizations and institutions and complement existing warning frameworks, including within a multi-hazard approach where appropriate;

Recommend that each Member State in the Indian Ocean quickly identify and establish a National Tsunami Warning Centre or operational contact point in the relevant responsible agency, along with a response plan, to be able to receive and react to warnings on a 24×7 basis and further rapidly disseminate warning information;

Recommend that each Member State in the Indian Ocean identify a disaster management national focal point for increasing public awareness of tsunamis, within a multi-hazard approach as appropriate;

Recommend that all Member States make every endeavour to share seismic, sea-level and other data relevant to tsunamigenic events at or near real-time with interested Member States;

Recommend that all Member States make every endeavour to share national assessments and warnings of tsunamigenic events and tsunamis with interested Member States in a timely manner;

Welcome the various intentions and plans of Member States in the Indian Ocean to establish effective and durable national systems for tsunami early warning;

Welcome the intentions and plans of Australia, India, Indonesia, Malaysia and Thailand to establish systems and capacities to detect potential tsunamigenic events, detect and measure tsunamis, and issue appropriate warning to forecast their impacts and to provide such information and warnings to other interested Member States;

Welcome that other centres may be established to act as dissemination points for the relay of information and for technical support and training, such as the one proposed by France for the southwest Indian Ocean;

Recommend that efforts to establish an IOTWS be appropriately consistent with efforts to implement the International Strategy for Disaster Reduction (ISDR) and the Hyogo Framework for Action;

Welcome the many generous offers of financial, technical and other kinds of assistance made by key countries across the globe to help establish an IOTWS;

Encourage all Member States to provide financial, technical and other kinds of assistance in order to promote national capacity and cooperation as well as preparedness, mitigation and prevention, if so requested by the Member States in the Indian Ocean;

Welcome that, in addition to the steps taken, or to be taken, by countries of the Indian Ocean, the UNESCO/IOC and ISDR for interim tsunami warning, the Pacific Tsunami Warning Centre and the Japan Meteorological Agency have agreed to provide, if requested, reliable interim tsunami advisory information to authorized contacts in the Indian Ocean States. Member States are requested to provide to UNESCO/IOC their official 24×7 contact information (prime and alternate) for receiving this information by 1 April 2005;

Welcome also the attention and intention to address tsunami disaster mitigation in other oceans and seas, such as South-East Asia and the South China Sea, within the global framework;

Note the need to develop mechanisms for effective coordination of tsunami warning systems for all at-risk regions on a global basis;

Appreciate the financial contribution made by Japan through the UN Flash Appeal to help make the first meeting possible;

Agree to consider, *inter alia*, at the Second International Coordination Meeting for the Development of an IOTWS the following issues: (a) keep under constant scrutiny the status of the system and its performance (b) the coordination of donor activities and other tsunami-related activities;

Recommend that the IOC Secretariat enter into consultation with Member States with the view to addressing the feasibility of constituting *ad hoc* technical working groups on: (a) measurement systems, including data management, standards and interoperability; (b) risk management, including assessment and modelling; and (c) warning systems, including

dissemination and communications. The IOC Secretariat will report to the April meeting on the progress of this recommendation.

Welcome and accept the generous offer of the Republic of Mauritius to host the second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System at high level to be held at Port Louis on 14–16 April 2005.

*Paris, 8 March 2005*

Annex 3 to Resolution XXIII-12

**Declaration of the Second International Coordination Meeting  
for the Development of a Tsunami Warning and Mitigation System  
for the Indian Ocean**

Grand Baie, Mauritius, 14–16 April 2005

We, the participants of the Second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System held in Grand Baie on 14–16 April 2005:

1. Recall the many directions and guidance provided by the Special ASEAN Leaders' meeting in Jakarta on 6 January 2005, the UN Conference on Small Island Developing States held in Port Louis on 14 January 2005, the UNGA Resolution 59/279 in New York on 19 January 2005, the Common Statement of the Special Session on Indian Ocean Disaster and the Hyogo Framework for Action 2005–2015, both adopted at the World Conference on Disaster Reduction in Kobe on 22 January 2005, the Ministerial Declaration in Phuket on 29 January 2005, the GEO Communiqué in Brussels on 16 February 2005, and the technical meetings held in India, China and Indonesia;
2. Endorse the communiqué adopted by the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a global framework held in Paris at UNESCO Headquarters on 3–8 March 2005;
3. Reaffirm that the Indian Ocean Tsunami Warning System (IOTWS) will be a coordinated network of national systems and capacities;
4. Reaffirm also the need for the establishment of an Intergovernmental Coordination Group (ICG) by the Intergovernmental Oceanographic Commission (IOC) Assembly to govern the IOTWS;
5. Recognize the unique tectonic plate structure of the Indian Ocean, and that there are primarily two tsunamigenic sources that could affect the coastlines of the Indian Ocean, namely the Indonesian seismic zone and its extensions, about 4000 km in length, and the Makran source;
6. Welcome the plans and intentions of Australia, India, Indonesia, Malaysia and Thailand to develop their national capability to detect, analyse and provide timely warning of tsunami generated along the Indonesian seismic zone and its extensions, as well as the plans of India, Iran and Pakistan to cover the Makran source;

7. Encourage these countries to continue to cooperate closely in developing their national systems to ensure effective coverage of the above-mentioned tsunamigenic zones;
8. Reaffirm that each Member State should have the responsibility to issue warnings within their respective territories;
9. Urge the ICG, as the governing body of the IOTWS, to develop and coordinate appropriate arrangements for the effective and timely dissemination of tsunami advisory information and warnings;
10. Reaffirm that all regional efforts should serve the purpose of strengthening international cooperation aimed at the creation of a global multi-hazards warning system;
11. Welcome the plans and intentions of all countries of the Indian Ocean to enhance their abilities to receive tsunami advisory information and warnings and issue appropriate warnings within their respective territories on a 24x7 basis;
12. Welcome the efforts by countries of the Indian Ocean to, jointly or individually, enhance their capacity to build knowledge, public awareness, preparedness, including through the use of traditional knowledge, and exchange good practices globally;
13. Recognize the many generous offers of financial, technical and other kinds of assistance made by countries across the globe to help establish the IOTWS, including the further generous pledges of assistance made at the Mauritius meeting;
14. Invite the countries of the Indian Ocean to complete by July 2005, where necessary with the support of UNESCO/IOC, an assessment of their requirements and capacity needs for an effective and durable national tsunami warning and mitigation system, to be followed by the development of appropriate national strategic plans;
15. Welcome the readiness of Member States and other donors to provide further financial, technical and other kinds of assistance to promote national capacity, and in this context request UNESCO/IOC to develop a mechanism to coordinate donor assistance in relation to assessed needs;
16. Note with appreciation that the Pacific Tsunami Warning Centre (PTWC) and Japan Meteorological Agency (JMA) have started to provide interim tsunami advisory information to authorized contacts in the Indian Ocean States, that many Member States have already provided information on their designated contact points and that the remaining Member States will provide this information as soon as possible;
17. Express our determination to enhance regional and national capacities for tsunami detection, including through further upgrading of existing observation facilities;
18. Reaffirm our commitment to an open, free and unrestricted sharing of tsunami-relevant real-time observational data in accordance with the UNESCO/IOC Oceanographic Data Exchange Policy and without prejudice of the sovereignty of Member States;
19. Call for the formal creation of the IOTWS and the Intergovernmental Coordination Group for the IOTWS by a resolution at the Assembly of the Intergovernmental Oceanographic Commission (IOC) to be held in Paris on 21-30 June 2005;

20. Request Indian Ocean Member States to report to the forthcoming IOC Assembly on national progress made in establishing IOTWS;
21. Recommend that the first meeting of the Intergovernmental Coordination Group of the IOTWS be held in the second half of 2005 and, among other matters, develop a strategic plan to implement the IOTWS;
22. Request the UNESCO/IOC Secretariat to finalize the technical plans for the detection systems of the IOTWS through the convening of the technical working groups identified at the Paris meeting, for consideration by the first meeting of ICG/IOTWS;
23. Appreciate the financial contribution made by Japan to make the Second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System possible;
24. Express appreciation to UNESCO's Intergovernmental Oceanographic Commission for its strong coordination role, the UN International Strategy for Disaster Reduction Secretariat for its guidance and support, and the World Meteorological Organization for its infrastructure and technical support;
25. Also express appreciation to the Government of Mauritius for hosting the Second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System.

*Grand-Baie, Mauritius, 16 April 2005*

#### Resolution XXIII-13

### **ESTABLISHMENT OF AN INTERGOVERNMENTAL COORDINATION GROUP FOR TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS**

The Intergovernmental Oceanographic Commission,

**Extending** our solidarity with, and support to, the people affected by the devastating tsunami that occurred on 26 December 2004 in the Indian Ocean, and recognizing the urgent need to develop a Global Tsunami Warning and Mitigation System as an integral part of a multi-hazard approach,

**Recalling** IOC Resolutions XX-14, July 1999, EC-XXXV.1, EC-XXXV.5 (recommendation SC-IOCARIBE-VII.2) June 2002, and EC-XXXVII.7, approving and supporting the establishment of a Tsunami Warning System for the Caribbean and Adjacent Regions and IOCARIBE-GOOS,

**Noting** directions and guidance provided by the Mauritius International Meeting on Small Island Developing States held at Port Louis from 10 to 14 January 2005; UNGA Resolution 59/279 adopted in New York on 19 January 2005; the Hyogo Framework for Action 2005-2015 adopted at the World Conference on Disaster Reduction in Kobe on 22 January 2005; the Communiqué of the 3<sup>rd</sup> Earth Observations Summit (GEO) adopted in Brussels on 16



February 2005; the Paris Communiqué adopted on 8 March 2005; and the contributions from several regional technical meetings,

**Noting further** the Communiqué of the International Conference for the Establishment of a Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions adopted in Mexico City on 3 June 2005, as annex 1 to this Resolution,

**Acknowledging** the important role that the International Tsunami Information Centre (ITIC) has played, particularly in capacity-building,

**Recalling** the long experience of the Pacific Tsunami Warning Centre (PTWC) as the operational centre for ITSU, and that PTWC is already providing tsunami warning guidance to some Central American countries, Puerto Rico and the US Virgin Islands, with the Atlantic Tsunami Warning Centre (ATWC) providing back-up and warning guidance for Atlantic regions, and noting existing facilities and capabilities in Puerto Rico and in other countries of the region,

**Further recalling** that the Assembly through Resolution XXII-6 approved the IOC Oceanographic Data Exchange Policy, which states that the timely, free and unrestricted international exchange of oceanographic data is essential, among others, for the preservation of life,

**Acknowledging** the role of GLOSS and GOOS, as an essential component of GEOSS, and particularly the contribution of IOCARIBE-GOOS to the development of a Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions,

**Invites** the PTWC to extend its warning guidance to the Caribbean and Adjacent Regions on an interim basis until such time as this capability can be managed independently within the region, developing the regional concept by strengthening and integrating existing capacities and capabilities;

**Decides:**

- (i) to establish an Intergovernmental Coordination Group (ICG) for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions with the Terms of Reference as Annex 2 to this Resolution;
- (ii) that the IOC shall provide the Secretariat of the ICG for the Caribbean and Adjacent Regions;
- (iii) to support through its ITIC the development of communications and capacity-building activities to assist communities to be resilient in the region;

**Instructs** the IOC Executive Secretary to provide support as needed for this urgent and critical activity;

**Urges** Member States of the Caribbean and Adjacent Regions to submit to the IOC Executive Secretary in writing the name of the designated authority acting as National Tsunami and Other Coastal Hazards Focal Point, with responsibilities to officially receive tsunami and other coastal hazard-related information bulletins and warning guidance, and the name of the institution or organization acting as National Tsunami and Other Coastal Hazards Warning Centre to issue warnings and related products, or responsible for the development of such capabilities;

**Further urges** Member States and international and regional organizations to provide voluntary contributions to the IOC in order to assist the Commission in the effective provision of secretariat services for the assessment, planning and implementation of the regional early-warning and mitigation system.

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Identified funding (2006–2007):       US\$ 20,000 from MLA3  
                                                          US\$ 360,000 from Extra-budgetary resources to be identified

#### Annex 1 to Resolution XXIII-13

### **International Conference for the Development of a Tsunami and Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions**

Hotel Sevilla Palace, Mexico DF, 1–3 June 2005

The participants of the International Conference for the Development of a Tsunami and Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, after an intensive three days of work and reflection and being aware of the immediate need to create and implement a tsunami warning system which facilitates the application of adequate and effective measures for the protection of the population and the economies of our countries to cope with the hazards and effects of the tsunamis and other natural phenomena, decided to issue the following:

#### **COMMUNIQUÉ**

Express our solidarity and support to the people affected by the devastating tsunami that occurred on 26 December 2004 in the Indian Ocean, as well as recognize the need to urgently develop a Global Tsunami Warning and Mitigation System.

Noting the results of the meetings recently held in Paris, Barbados, Managua and Jamaica where initiatives and ideas were sought towards the implementation of a global system and other sub-regional systems respectively.

Recognizing the leadership of the Intergovernmental Oceanographic Commission of UNESCO in the historical development of the International Tsunami Warning System in the Pacific (ITSU) and its status as a coordination mechanism for international cooperation, development, and implementation of a Global Tsunami Warning and Mitigation System and its respective regional components, among them the Caribbean system.

Further recognizing the long experience of the Richard H. Hagemeyer Pacific Tsunami Warning Centre (PTWC) in Hawaii as the operational centre for ITSU, and the fact that PTWC is already providing limited tsunami warning guidance to Puerto Rico and the US Virgin Islands;

Considering that, besides ongoing sub-regional and regional initiatives, it is necessary to address the mandate of all our Member States for the development of a technical and political process facilitating the implementation of an integrated, coordinated, and sustainable regional system, which guarantees an adequate programme for detection and alert, mitigation, risk-

evaluation, training, education and capacity-building for all levels of society, as well as for scientific research.

Acknowledging that, despite present gaps of knowledge about tsunami risks and other natural hazards in our region, we have the obligation to act accordingly, bearing in mind that the essential problem is not a matter of “if” such natural phenomena will occur but “when” they will occur, considering that “when” could be any time in the future.

Acknowledging further that the impacts of tsunamis and other natural hazards can be drastically reduced through the development of adequate legal, policy, and institutional mechanisms, including the strengthening of education and community involvement.

### **AGREE TO**

Recognize and support the creation of an integrated, and sustained regional system for the detection, forecasting, warning, and mitigation of tsunami and other coastal hazards, that could contribute adequately to other international programmes such as GOOS of IOC (UNESCO) and through this, to GEOSS.

Approve and support the preliminary IOCARIBE Action Plan prepared by this meeting.

Submit for consideration by the Intergovernmental Oceanographic Commission of UNESCO, the IOCARIBE Integrated Regional Programme as a contribution to the ongoing Global Tsunami Warning and Mitigation System.

Recommend that the IOC Assembly establish, in accordance with its rules of procedure, an Intergovernmental Coordination Group for the Caribbean Tsunami and Coastal Hazards Warning System, which will govern the system. Such a group will be composed of IOC Member States and regional organizations from the Wider Caribbean Region (WCR). All the other Members of the IOC, as well as concerned international and regional public and private sector organizations, will be welcome to participate.

Request the Secretariats of the Intergovernmental Oceanographic Commission of UNESCO and the IOCARIBE Sub-Commission to allocate and search for necessary resources to implement the Action Plan as outlined at this meeting.

Recommend to expand the IOCARIBE Tsunami Steering Group of Experts into an interdisciplinary Tsunami and Coastal Hazards Group of Experts, and to organize a meeting of this group before the end of this year.

Further request that the Group of Experts present to the IOCARIBE Sub-Commission the Action Plan mentioned before, with the special instruction to identify those actions that can be executed in the short term with the available resources at national and regional level including the support of possible donors.

Recognize that Member States have the responsibility to issue warnings within their respective territories.

Request PTWC to extend its warning guidance to the WCR on an interim basis until such time as this capability can be managed independently within the region, and request IOC (UNESCO) to provide support as needed for this urgent and critical activity.

Request IOCARIBE to ask Member States to provide by July 1, 2005 their contact points and contact methods for receiving the interim tsunami warning guidance bulletins.

*Mexico City, 6 p.m., 3 June 2005*

Annex 2 to Resolution XXIII-13

**Terms of Reference for the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions**

Will be established as a subsidiary body of the IOC and will report to, and seek guidance from, the IOC Assembly.

**Objectives:**

1. To coordinate the activities of the tsunami and other coastal hazards system;
2. To organize and facilitate as appropriate the exchange of seismic, sea level and other data at or near real-time and information required for the interoperability of the tsunami and other coastal hazards system;
3. To promote the sharing of experience and expertise related to tsunami warning and mitigation for the Caribbean and Adjacent Regions Basin;
4. To promote tsunami and other coastal hazards research;
5. To promote the establishment and further development of national tsunami and other coastal hazards warning and mitigation capacities in accordance with standard protocols and methods;
6. To develop, adopt and monitor implementation of work plans of the tsunami and other coastal hazards warning system in the Caribbean and Adjacent Regions, and to identify required resources;
7. To promote implementation of relevant capacity-building;
8. To liaise and coordinate with other tsunami and other coastal hazards warning systems;
9. To liaise with other relevant organizations, programmes and projects;
10. To promote the implementation of the ICG within a multi-hazard framework;
11. To keep under constant scrutiny the status of the system and how it satisfies the needs.

**The secretariat for the ICG shall:**

1. Support meetings of the ICG in the region;
2. Facilitate the liaison among the various national contact points and national tsunami warning centres;

3. Maintain a current list of operational national contact points and facilities and make it available on request to all Member States;
4. Organize the liaison between ICG and the ICG/ITSU, with the PTWC, ATWC and with other tsunami warning centres to facilitate best practices in tsunami warning;
5. Initiate and support, in coordination with ITIC, training activities and enhance and enrich tsunami and other coastal hazards warning in the Caribbean and Adjacent Regions.

**Membership:**

- Member States of the IOC from the Caribbean and Adjacent Regions
- Observers from other IOC Member States
- Invited observers from other organizations (including NGOs), programmes and projects in accordance with the IOC rules and procedures.

Resolution XXIII-14

**INTERGOVERNMENTAL COORDINATION GROUP FOR THE TSUNAMI EARLY WARNING AND MITIGATION SYSTEM IN THE NORTH-EASTERN ATLANTIC, THE MEDITERRANEAN AND CONNECTED SEAS**

The Intergovernmental Oceanographic Commission,

**Following** the guidance of the World Conference on Disaster Reduction held in Kobe, Hyogo, Japan, 18–22 January 2005, and of the Hyogo Framework for Action 2005–2015 adopted by that World Conference,

**Considering** the 26 December 2004 event in the Indian Ocean that showed the devastating power of the tsunami and that its disastrous consequences could have been reduced if a tsunami early-warning system had been in place,

**Being aware** that tsunamis pose threats in all ocean basins of the world, and that the protection of the coastal populations and mitigation of tsunami effects is a high priority,

**Recognizing** that the north-eastern Atlantic, the Mediterranean and connected seas are regions with identified potential for catastrophic tsunamis and with a long known history of tsunami events,

**Noting** that:

- (i) no effective regional tsunami early-warning system is in place in the north-eastern Atlantic, in the Mediterranean and connected seas, and that the effects of a large tsunami in the area would be more disastrous than in the case of historical events, given the huge increase in coastal development and use in modern times,

- (ii) these areas include countries with different levels of resources and development and that assistance to disaster-prone developing countries to set up national strategies and plans of actions and programmes for disaster risk reduction is one of the identified priorities of the Hyogo Framework,
- (iii) a project for building up a European monitoring and alert system on tsunamis covering the European waters in the Atlantic, Mediterranean and connected seas is under consideration by the European Commission,

**Decides:**

- (i) to establish an Intergovernmental Coordination Group for a Tsunami Early Warning System in the North-eastern Atlantic and the Mediterranean and Connected Seas (ICG/NEAMTWS) with the Terms of Reference annexed to this Resolution, and that such a Tsunami Warning and Mitigation System be developed within the global framework of IOC;
- (ii) that the IOC shall provide the Secretariat of the ICG/NEAMTWS;

**Invites** Member States and other international and regional organizations to provide voluntary contributions to the IOC Trust Fund in order to assist the IOC in the effective provision of secretariat services for the ICG/NEAMTWS;

**Instructs** the IOC Executive Secretary to initiate consultations with the European Commission on cooperation and mobilization of support for the establishment of the ICG/NEAMTWS;

**Welcomes** and **accepts** the offer of Italy to host the first meeting of the ICG/NEAMTWS in Rome before the end of 2005.

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Identified funding:                   US\$ 30,000 from extra-budgetary resources to be identified.

Annex to Resolution XXIII-14

**Terms of Reference for the Intergovernmental Coordination Group  
for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic,  
the Mediterranean and Connected Seas**

The ICG will be established as an intergovernmental subsidiary body of the IOC and will report to, and seek guidance from, the IOC Assembly.

**Objectives:**

1. To coordinate the activities of the ICG/NEAMTWS;
2. To organize and facilitate, as appropriate, the exchange of seismic, geodetic, sea-level and other data in or near real-time and information required for interoperability of the ICG/NEAMTWS;
3. To promote the sharing of experience and expertise related to tsunami warning and mitigation for the north-eastern Atlantic, the Mediterranean and connected seas;

4. To promote tsunami research;
5. To promote the establishment and further development of national tsunami warning and mitigation capacities in accordance with standard protocols and methods;
6. To develop, adopt and monitor implementation of work plans of the ICG/NEAMTWS, and to identify required resources;
7. To promote implementation of relevant capacity-building;
8. To liaise and coordinate with other tsunami warning systems;
9. To liaise with other relevant organizations, programmes and projects;
10. To promote the implementation of the ICG/NEAMTWS within a multi-hazard framework;
11. To develop a comprehensive programme of capacity-building on tsunami protection for the north-eastern Atlantic, the Mediterranean and connected seas, including the Black Sea;
12. To keep under constant scrutiny the status of the system and how it satisfies the needs.

**The Secretariat for the ICG/NEAMTWS shall:**

1. Support meetings of the Intergovernmental Coordination Group;
2. Facilitate the liaison among the various national contact points and national tsunami warning centres;
3. Maintain a current list of operational national contact points and facilities and make it available on request to all Member States;
4. Organize the liaison of the ICG/NEAMTWS with the PTWC and with other tsunami warning centres to facilitate best practices in tsunami warning;
5. Initiate and support, in consultation with ITIC, training activities and enhance and enrich warning in the north-eastern Atlantic and the Mediterranean and connected seas.

**Membership:**

- Member States of the IOC bordering the north-eastern Atlantic and those bordering and within the Mediterranean Sea and connected seas.
- Observers from other IOC Member States.
- Invited observers from other organizations (including NGO's), programmes and projects in accordance with the IOC rules and procedures.

Resolution XXIII-15

**ESTABLISHMENT OF A FRAMEWORK FOR THE GLOBAL TSUNAMI AND  
OTHER OCEAN-RELATED HAZARDS EARLY WARNING SYSTEM**

The Intergovernmental Oceanographic Commission,

**Recalling** the Johannesburg Plan of Implementation adopted at the 2002 World Summit on Sustainable Development; the Mauritius Strategy for the further implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States adopted in Port Louis on 14 January 2005; the UNGA Resolution 59/279 adopted in New York on 19 January 2005; and the Hyogo Declaration and Hyogo Framework for Action 2005–2015 of the World Conference on Disaster Reduction adopted in Kobe on 22 January 2005; the Communiqué of the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework adopted in Paris on 8 March 2005; and the Mauritius Declaration on the Second International Coordination Meeting for the Development of an Indian Ocean Tsunami Warning and Mitigation System adopted in Grand Baie on 16 April 2005,

**Noting:**

- (i) the Communiqué of the Third Earth Observation Summit adopted in Brussels, Belgium, on 16 February 2005, which supports "the coordinating activities of the UNESCO Intergovernmental Oceanographic Commission (IOC) and related national and regional initiatives to realize effective tsunami warning systems in the Indian Ocean and other regions of the world, as an integral part of a multi-hazard approach supported by GEOSS (Global Earth Observation System of Systems)",
- (ii) that the purpose of the International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU), established by the Fourth Session of the IOC Assembly (3–12 November 1965) through Resolution IV-6, is to provide or improve all aspects of tsunami warning and mitigation in the Pacific including hazard assessment, warnings, preparedness and research through a system of international cooperation and coordination of activities,
- (iii) the ongoing process establishing regional warning systems for tsunami and other ocean-related hazards,

**Further noting** the Mauritius Declaration of 16 April 2005 that stated "all regional efforts should serve the purpose of strengthening international cooperation aimed at the creation of a global multi-hazards warning system",

**Acknowledging** the achievements and effectiveness of existing ocean observing systems, mechanisms of international real-time data and information exchange, and progress in ocean data assimilation, modelling, forecasting and capacity-building,

**Recognizing** that a global tsunami and other ocean-related hazards early-warning system should:

- (i) build on existing mechanisms and capabilities and should address all the necessary components for an integrated end-to-end system, which are hazard and risk assessment, warnings, and preparedness, and recognizing the IOC's comparative



advantage in ocean-related observations, data management, forecasting, dissemination of forecasts and warnings and capacity-building;

- (ii) improve our understanding and forecasting of ocean hazards to reduce their impact through focused scientific research and technological development;
- (iii) utilize and work to improve durable global observational capabilities, particularly through the transfer of marine technology, taking into account the IOC Criteria and Guidelines on the Transfer of Marine Technology (CGTMT);
- (iv) make available the information to the entire world;

**Decides** to establish an ad hoc Working Group to prepare a framework for a global tsunami and other ocean-related hazards early-warning system,

**Instructs** the IOC Executive Secretary to:

- (i) invite Member States and Chairpersons of relevant IOC subsidiary bodies to participate in this ad hoc Working Group;
- (ii) invite the WMO, ISDR, GEO and relevant intergovernmental and other organizations to participate in the work of the ad hoc Working Group;
- (iii) submit the report of the ad hoc Working Group to the 39<sup>th</sup> Session of the Executive Council.

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Identified funding:       US\$ 30,000 from Extra-budgetary resources for one meeting of the ad hoc Working Group in 2006.

#### Resolution XXIII-16

### **IOC PROGRAMME AND BUDGET FOR 2006–2007**

The Intergovernmental Oceanographic Commission,

**Recalling** Article 1 (2) and Article 10 (1) of the IOC Statutes,

**Noting** the presentation of the IOC Draft Programme and Budget for 2006–2007, as contained in Document IOC-XXIII/2 Annex 3 rev.,

**Emphasizing** the flagship status of IOC within UNESCO as designated in the 31 C/4 — Medium-term Strategy 2002–2007,

**Emphasizing further** the unique role of the IOC as the competent intergovernmental body dealing with ocean science and ocean services within the United Nations system, particularly as the ocean arm of UNESCO, operating through the concerted action of IOC Member States,

**Noting** the increased responsibilities IOC is called upon to fulfil, especially the coordination of the establishment of the Indian Ocean Tsunami Warning and Mitigation System (IOTWS),

**Also noting** the role IOC plays in the technical coordination with other UN Specialized Agencies and Programmes,

**Having considered** the proposals regarding the structure, formulation and budgetary framework for 2006–2007 biennium contained in the UNESCO *Draft Programme and Budget for 2006–2007*, 33 C/5, which includes a ca. US\$900,000 reduced allocation to IOC,

**Concerned** that the proposed reduction of the regular budget allocation from UNESCO to IOC would negatively impact the current programmes and activities of the Commission, especially the implementation of regional components of programmes,

**Stressing** the importance of:

- (i) the regular funds provided by UNESCO in attracting supplementary support from Member States, notably through contributions to the IOC Special Account, and secondment of personnel,
- (ii) the continuing support by Member States in addressing the long-term plans of the IOC, through voluntary extra-budgetary contributions,

**Accepts** as an interim measure, a uniform cut applied to each Main Line of Action for the proposed IOC Programme and Budget 2006–2007;

**Decides** that the IOC Programme and Budget for 2006–2007 should be based upon three main lines of action:

- (i) Main line of Action 1: Addressing scientific uncertainties for the management of the marine environment and climate change;
- (ii) Main line of Action 2: Developing operational capabilities for the management and sustainable development of the open and coastal ocean;
- (iii) Main line of Action 3: Capacity of Member States in marine science for the coastal ocean strengthened;

**Adopts** the following Draft IOC Programme and Budget 2006–2007:

TITLE	Amount
<b>MLA 1 Addressing scientific uncertainties for the management of the marine environment and climate change</b>	
Oceans & Climate	186,930
Ecosystem Protection & Marine Environment Protection*	177,585
*of which, HAB activities	60,348
ICAM	286,800
<b>Sub-total MLA 1</b>	<b>651,315</b>
<b>MLA 2 Developing operational capabilities for the management and sustainable development of the open and coastal ocean</b>	
GOOS	606,423
<i>Rio GOOS Staff</i>	<i>66,000</i>
<i>Perth Office Staff</i>	<i>160,000</i>
<i>GOOS-Africa Staff</i>	<i>50,000</i>

TITLE	Amount
ITSU	72,123
JCOMM	139,831
<i>JCOMM Staff</i>	<i>50,000</i>
IODE Activities	143,510
<i>Ostend Office Staff</i>	<i>120,000</i>
Ocean Mapping	60,348
<b>Sub-total MLA 2</b>	<b>1,468,235</b>
<b>MLA 3 Capacity of Member States in marine science for the coastal ocean strengthened</b>	
Capacity-building	430,494
Ocean Governance & UNCLOS	135,415
<i>UNCLOS/ABE-LOS Cons.</i>	<i>100,000</i>
Governing Bodies & Public Awareness	235,504
<i>ADG/Office Staff</i>	<i>250,000</i>
Regional activities	95,637
<i>WESTPAC Staff</i>	<i>125,000</i>
<i>IOCARIBE Staff</i>	<i>230,000</i>
<i>HAB Office Staff</i>	<i>100,000</i>
<b>Sub-total MLA 3</b>	<b>1,702,050</b>
<b>TOTAL ALLOCATION*</b>	<b>3,821,600</b>

\* As reflected in the current UNESCO Draft Programme and Budget (610 million US\$-baseline scenario). Further reduction of approx. 13.4% to programme activities lines is anticipated in order to cover the IOC's share of running costs.

**Appeals** to the Thirty-third General Conference of UNESCO to approve the supplementary amount of US\$ 1,000,000 to be allocated to IOC for helping Member States to develop Tsunami Early Warning Systems;

**Establishes** an ad hoc open-ended working group chaired by the Vice-Chairman in charge of Programme and Budget, to:

- (i) consider possible future scenarios for the organization that could be used to reformulate its mechanisms and medium and long-term plans predicated on IOC mission priorities and on a consistent set of programme performance metrics;
- (ii) report on progress to the 39<sup>th</sup> Session of the Executive Council;
- (iii) define the outlines of the IOC Programme and Budget 2008–2009, to be submitted to the 39<sup>th</sup> Executive Council;

**Authorizes** the Executive Council at its 39<sup>th</sup> Session, to approve the Main Lines of Action for the 2008–2009 biennium;

**Urges** Member States:

- (i) to support the IOC programme proposals when the Draft 33 C/5 is being considered by the UNESCO Executive Board and the General Conference;

- (ii) to continue and increase their support to the IOC through direct and in-kind contributions.

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Identified funding: not applicable.

ANNEX III

**ADDRESSES**

A. Opening address

**by Mr Koïchiro Matsuura**  
**Director-General of the United Nations Educational, Scientific and Cultural Organization**  
**(UNESCO)**

21 June 2005

Mr President,

Ladies and Gentleman,

It is a real pleasure to meet with you once again and a particular honour to address you at the opening of this 23rd session of the IOC Assembly, when the resolution that will validate the establishment of the Indian Ocean Tsunami Warning System (IOTWS) and its Intergovernmental Coordination Group (ICG) will be discussed and adopted. You have a full and rich agenda before you and I wish you a successful and productive meeting.

As you are no doubt aware, the past months have been special times for UNESCO and its IOC because of the tsunami of 26 December 2004 that had such a devastating impact on many countries in the Indian Ocean region. The tsunami was unprecedented in its tragic consequences in terms of the loss of human life and the disruption of the lives of millions of people who saw their homes and livelihoods threatened and their future rendered uncertain.

UNESCO and its IOC were called upon by the international community to play the leading role in efforts to establish a tsunami warning system for the Indian Ocean, based on their unequalled experience, gained from operating such a system in the Pacific Ocean since 1965. We have addressed this task with great energy, including by organizing two major intergovernmental meetings to advance the planning of the response and to channel into a single process several initiatives that had emerged independently. In the first coordination meeting, held in Paris in early March, the 27 countries of the Indian Ocean rim agreed to work within the framework offered by the IOC through an ICG. A second successful coordination meeting was held from 14 to 16 April in Mauritius, further re-enforcing the Paris consensus and vesting the IOC with further responsibilities, especially in the areas of needs assessment and capacity-building required for the establishment of the national warning centres that will form the backbone of the IOTWS.

In order to ensure immediate coverage of the region, we established emergency measures to broadcast interim tsunami advisory information to the countries in the Indian Ocean, and they agreed to establish national operational centres to receive this information. Today, there are 19 operational centres functioning. These centres played an important role on 29 March when a second strong earthquake menaced the region.

Finally, with resources from the humanitarian relief exercise, we have also moved fast to upgrade existing observational networks to enable them, within the next six months, to detect tsunamis. I am pleased to inform you that, for the first time, we now have six stations that, broadcasting in real-time, can confirm the presence or absence of a tsunami after a strong earthquake in the Indian Ocean. With strong national contributions from within and outside the

region, we are committed to finalize a full-fledged system, including the installation of deep-sea pressure sensors, by July 2006.

The present session of the IOC Assembly represents an important milestone in the establishment of the IOTWS. As I mentioned earlier, it is here that the resolution that will validate the establishment of the system and its ICG will be debated and adopted. This final validation will then permit us to move ahead with the first meeting of the ICG, which I hope will be in early September in a country in the Indian Ocean region.

Ladies and Gentlemen,

The statutes of IOC define its mission as an intergovernmental body. The purpose of the Commission is, and I quote, 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.

In summary, there are two functions that are part of the mission of IOC: to produce knowledge and to apply knowledge. The first part, to learn more, is done through the development of research programmes. We have never done this in isolation. To succeed in this aspect of IOC's mission, we need to have valid and legitimate links with the scientific community. Governments play an important part financing these activities and supporting long-term programmes monitoring the oceans and coasts, but their role in this first function is subsidiary to the main objective, namely, to increase our knowledge of the ocean, coastal areas and its resources. Individual scientists would tend to agree with this description, because very often they have difficulty in understanding the role of governments in “guiding” science. Scientists themselves are best positioned to identify the next step in their search for knowledge and we all should recognize that there are long-established and well accepted practices to be respected in this domain.

However, it is in the fulfillment of the second function—to apply knowledge for the improvement of management and the decision-making process—that IOC's intergovernmental character becomes essential. Here the role of governments is far from being subsidiary. It is governmental action that must inform the decisions of the Commission in this domain. Governments have to decide where to apply the science, what problems to address, what the areas are that require urgent decision-making. Many segments of society also can and do participate in this process, the results of which may be the proposal of policy guidelines, norms or the establishment of permanent services such as the tsunami warning system. Each case will be different and will require strong governmental involvement at each stage of development.

Applications of science are possible at any given time if sufficient creativity and ingenuity are applied to provide the solutions. The science available for tsunami protection has progressed, but it is essentially the same as that which enabled IOC to establish the Pacific system in 1965. It was not a major breakthrough in the geosciences that moved the IOC to design the system. It was a clear case of need expressed clearly by government representatives after two major tsunamis - in Valdivia, Chile, in 1960, and in Alaska, USA, in 1964.

The system does not forecast tsunamis. Its purpose is more humble. It is designed to do what we can do, that is, detect tsunamis in the ocean after they have been generated and to warn distant places of their possible imminence. It is illustrative to look at the system and how it works. Since only a minority of strong, shallow earthquakes generate tsunamis, tsunami

warnings cannot be based on seismic information alone. When a strong shallow earthquake occurs, the tsunami warning system issues an “information bulletin” transmitting the seismic information available and enters automatically in a mode of “watch”. Travel times and arrival times of the possible tsunami are calculated and sent to all participating centres and the observing network of national tsunami centres is alerted. As soon as the estimated arrival time to the first detection station has been surpassed and the instrument has detected a tsunami, a tsunami warning can be issued; alternatively, if a tsunami is not detected, then the watch period can be cancelled. The system goes on and off, internally, many times in a given year, triggered by strong earthquakes, but on only a very few occasions is a tsunami warning issued.

The Pacific system has evolved in conjunction with scientific and technological progress. Sophisticated numerical modeling is used today to find the direction of propagation, for example, and more will certainly be done, but the heart of the system depends on this “procedure” which is based on ingenuity, common sense and the full exploitation of the knowledge and technologies available.

However, the Pacific system only works well for distant tsunamis; it is severely limited when it comes to local tsunamis. In building the Indian Ocean system as a whole, both kinds of tsunamis need to be catered for, though it has to be acknowledged that the risk of local tsunamis is unevenly distributed. The risk is greater in Indonesia, for example, than in Somalia. The important thing is that the national warning centres that will be established by each of the Member States of the region will cover the specific needs of each country. This is one of the reasons why we are investing considerable energy in providing help to those countries from the region that have requested it, to carry out needs assessments, both in respect of material and capacity-building requirements and in relation to distant and local tsunamis. The needs assessment in Sri Lanka is now complete, as are the ones for Kenya, Somalia, Tanzania, Oman, Myanmar and Pakistan.

Ladies and Gentlemen,

To fulfill its mandate, the IOC needs to increase and strengthen its intergovernmental character. We must improve our procedures to ensure that communication flows to the right levels of decision-making in governments. For example, I have been informed that the IOC is updating the list of focal points on an annual basis, asking governments to confirm their designees. This has already prompted some welcome changes and adjustments. There is clearly room for further initiatives of this nature but I leave you the harder task of defining them. Suffice it to say that these ‘communication’ requirements are very demanding for a great majority of countries, where ocean sciences and ocean technology are very weak and institutions still embryonic or non-existent. This is why our action must be accompanied by a strong capacity-building programme. I am happy to learn that in this Assembly you will be considering for final approval a new IOC strategy for capacity-building and a new implementation plan that emphasizes a regional and self-directed approach. These are very important developments.

This brings me to a second issue that I would like to address, namely, the austere budgetary situation that we face in UNESCO, which has forced us to undertake severe measures affecting almost all the programmes. Let me explain briefly.

You will be aware that I presented a budget of 635 million dollars to the Executive Board at its last session, for the 2006–2007 period. The discussions that ensued made it more or less clear, however, that the budget for the period will be 610 million dollars, in keeping with the zero nominal growth philosophy presently adopted by Member States throughout the UN system. In short, this means for UNESCO that we will be living with a drastically decreased budget

during the next biennium because we not only have to absorb nominal and statutory adjustments of some 33 million dollars, but also the expenditures resulting from increased security measures, the repayment of the loan made by France to the Organization for the renovation of the Fontenoy site, and so on—for a further 24 million dollars. This represents a colossal loss in budget of 57 million dollars!

As you can see, the situation is not bright. The only programmes that have been spared from drastic cuts are the five principal priority programmes approved by the General Conference, and to some extent, the IOC. Despite the very demanding conditions imposed by the maintenance of the 610 million dollar ceiling, I have included in the next biennium's draft programme and budget one new post in order to increase IOC's staff. Furthermore, I have included in the proposed voluntary contributions an additional one million dollars to be earmarked for tsunami early-warning activities under IOC.

In essence, I have proposed that UNESCO will start a new programme on disaster reduction and mitigation, making use of the expertise available in its Natural Science and Education sectors. I expect that we will be able to exploit all the potential synergies that may arise between the long-term involvement and leadership of IOC in this area and the activities that will be planned by this new programme of UNESCO.

I understand that during this session, you will be discussing issues of budget, guided by a paper prepared by one of your Vice-Chairmen, Mr Valladares from Argentina. The title of the paper is very telling: "Financing and ownership of IOC's Programmes: "We have a Problem". What the paper does very effectively is to call attention to the cost of inaction under the current circumstances. It is not my intention to influence or preclude an open discussion of these issues. However, I would like to say that I am optimistic that UNESCO and its IOC can today attract a significant flow of extra-budgetary, voluntary contributions, as we have done recently to implement the tsunami programmes. This is one of the clear options that the paper suggests, and I would encourage you to give it serious consideration.

Ladies and Gentlemen,

Organizations need to be creative to succeed in our times. Your own statutes give you a very wide and flexible tool when, in Article 10.3, it authorizes you to seek resources through voluntary contributions [which] may be accepted and established as trust funds in accordance with the financial regulations of the Special Account of IOC, as adopted by the Assembly and UNESCO and when, in Article 10.4, it states that The Commission may establish, promote or coordinate, as appropriate, additional financial arrangements to ensure the implementation of an effective and continuing programme at global and/or regional levels. These are very powerful tools indeed and you are fortunate to have them at your disposal.

IOC maintains a high level of interaction and cooperation with all the UN agencies active in ocean and coastal issues. IOC also serves as the implementation secretary of the UN-Oceans network that brings together 16 UN agencies and programmes, the World Bank, the Seabed Authority and the Secretariat of the CBD Convention. As was clearly reflected in several interventions by representatives of Member States in the last session of UNESCO's Executive Board, IOC has a well-established reputation. Member States are proud to count with your leadership in Ocean Sciences and its applications. The challenges are many, but as the Indian Ocean tsunami disaster has proven, we are well-prepared to respond. But we need to build a stronger IOC—and that possibility rests ultimately with you, the Member States active in the Commission.



Finally, I would like to wish you a most fruitful meeting. I look forward to hearing that you have adopted the resolution concerning the IOTWS and its ICG, for this is a project that I hold dear.

Thank you.

B. Statement  
**by Vice Admiral Conrad C. Lautenbacher, Jr. USN (ret.)**  
**Under Secretary of Commerce for Oceans and Atmosphere**

24 June 2005

**GEOSS: Science Serving Society**

Thank you Patricio.

Good morning colleagues and friends, and thank you for allowing me to present to you as a Co-chair of the Group on Earth Observations (GEO). In particular, allow me to take this opportunity to thank IOC Executive Director Patricio Bernal for his fine leadership at this challenging time following the December 26th earthquake and tsunami in the Indian Ocean.

I welcome the opportunity to share with you the considerable progress achieved toward creating the Global Earth Observation System of Systems (GEOSS), particularly in light of the Assembly's consideration of the Global Ocean Observing System's (GOOS) role in GEOSS. Recall that GOOS is the ocean component of GEOSS, and that GEOSS is the next higher-level integration of all earth systems and scientific disciplines. I believe that GOOS must be designed and implemented as a part of this global enterprise, for it is only in combination with other space, land, and atmospheric systems that GOOS can reach its full potential for scientific understanding and societal benefit. GEO, with the IOC as a key participating organization, has built on the common goal to produce societal benefits. Over time, GEOSS will provide an important scientific basis for sound policy and decision making in every sector of our society, including energy, public health, agriculture, transportation and numerous other areas that shape the quality of everyday life. In addition, GEOSS will enhance our capability to address natural disasters throughout the world.

Since the initial Earth Observation Summit in Washington, D.C., the number of member countries and participating organizations has nearly doubled from 50 to 100, a Ten-Year Implementation Plan has been created, the official GEO has been established, and priority has been given to coordinating our efforts to respond to the tragic December 26 earthquake and tsunami in the Indian Ocean region. The GEO is creating a tsunami working group that will be led by the IOC, Italy and Thailand, with active participation from the United States, WMO, Japan, Germany and others. The goals of this working group include recommending near-term GEO actions to complement existing efforts and identifying GEO actions to support an all-hazards early-warning system within GEOSS, fully leveraging the coordinated planning activity underway by the IOC.

As the permanent GEO moves forward, the Executive Committee will encourage mechanisms that empower the research communities' role in the future of GEO. The U.S., in its continuing role as Co-Chair to the GEO and as an active participant on GEO groups such as the Tsunami Working Group, is emphasizing our strong commitment to developing science that serves society. Within the United States, considerable progress has been made on its framework for contributing to GEOSS. For example, The U.S. Ocean Action Plan was published in

December 2004 as the Bush Administration response to the U.S. Commission on Ocean Policy. The Plan states clearly its support for GEOSS, GOOS (as the ocean component of GEOSS) and the U.S. Integrated Ocean Observing System (IOOS) as our component of GOOS. The U.S. encourages the development of international capacity building through working with the Global Sea Level Observing System (GLOSS) program of the IOC. GLOSS helps build capacity in developing countries for installing and operating tide-gauges, and for utilizing the resulting data to address societal needs.

The Plan recognizes and emphasizes lifelong education as a key to successful ocean stewardship through development of informed policy-makers and an informed public. The SEAREAD project implemented by the Pacific Island GOOS program is an example of a project focusing on secondary school students in order to generate awareness and discussion among students, teachers and communities in subjects such as global ocean observing systems, climate change, sea level rise, and the local impacts of these dynamics.

GEOSS will succeed by building on existing systems such as the GOOS and by capturing the attention of political leadership of the nations of the world on the capabilities of GEO members and participating organizations to identify and fill capability gaps. Existing programs and initiatives will thus become critical components of the GEOSS, while GEO helps to fill gaps and move them from serving scientists only, to serving society. In particular, GEO has established two, six and ten year targets to build capacity by coordinating global partnerships to enhance implementation of observing systems.

GEOSS will be comprehensive, by including observations and products gathered from all components required to serve the needs of participating members. GEOSS will be coordinated, in terms of leveraging resources of individual contributing members to accomplish this system, whose total capacity is greater than the sum of its parts. GEOSS will also be sustained, by the collective and individual will and capacity of participating members.

Deriving benefits from GEOSS requires international cooperation and much is linked to observing our oceans. For example, recent advances in the U.S. IOOS have led to an operational harmful algal bloom forecast for the Gulf of Mexico along Florida's west coast. Improved prediction, tracking, and forecasting of toxins in our oceans benefits fisheries, human health and ecosystems.

Improved monitoring and real-time reporting of tides, currents, salinity, and temperature can translate into millions of dollars of benefits for the shipping industry in port areas around the world. A preliminary economic study of one of our major seaports in Florida (Tampa Bay) indicates over a \$4M annual benefit from increased cargo loading and grounding avoidance using such a real-time observation system.

A comprehensive system of Earth observations will supply critical information, allowing us to predict and plan for droughts and other phenomena affecting our agricultural outputs. Estimates of costs associated with drought in the United States alone range from \$6 to \$8 billion annually. However, if we knew seasons and even years in advance that these patterns would be occurring, we could take necessary precautions such as crop planting decisions, seed selection, and fertilizer application, and even insurance policies, to mitigate the impacts. GOOS is again a critical element of GEOSS. Disaster mitigation is a key focus area for GEOSS. More comprehensive ocean observations—from tide gauges, buoys, and other fixed and mobile platforms—whose data is transferred in real time among interoperable systems will allow us to forecast with more accuracy and issue more effective warnings to coastal communities. A great example of integrating different data streams within the context of GEOSS can be taken from the

enhancement of tide gauge data collection technology to provide vital information to the tsunami warning network. These technology upgrades to existing tide gauges allow for high rate data sampling (one minute versus six minute) and automatic data transfer to emergency warning coordinators during Tsunami events. These changes are critical to providing timely tsunami warnings and verifications.

Of course, the recent tsunami in the Indian Ocean highlighted the importance of not just observations but of a warning system. IOC's leadership in convening two International Coordination Meetings for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean is an important catalyst to new regional and U.N. system-wide collaboration. It is imperative that we move forward on tsunami issues while they still hold the world's attention. UNESCO Director-General Koichiro Matsuura expressed his support for developing a global tsunami warning system within the GEOSS framework. And as UNEP Executive Director Klaus Toepfer has highlighted, an early-warning system must include all hazards, not just tsunami. The benefit of GEO is that it facilitates cost-effective, system integration across diverse in-situ and remote sensing observing platforms to enable us to build a multi-hazard warning system to protect and sustain society.

Implementation is the key to GEO's success. An all-hazards warning system, based on the immense benefits it would offer the world, is one of GEO's first real challenges. Another near-term challenge is the development of plans for improved management of Earth observation data. Our individual agencies' current data-management systems are already challenged to process current data streams. New observation systems will lead to a 100-fold increase in Earth observation data. The 10-Year Implementation Plan adopted at the Brussels Summit noted that GEOSS "will facilitate, within two years, the development and availability of shared data, metadata, and products commonly required across diverse societal benefit areas." Only by viewing observations as part of an end-to-end process will we fully maximize their utility.

At the recent GEO-I meeting in Geneva (May 3–4, 2005), IOC Executive Secretary Patricio Bernal presented an update on global tsunami early-warning capabilities. Participants underscored the need to address the challenges to implementation of a global tsunami warning system, such as interoperability among national and regional systems, data and technology standards, and the importance of timely and open exchange of data.

The GEO structure is evolving to take on these challenges. The newly-elected Executive Committee convened its first meeting following the GEO-I meeting, and met again earlier this month to focus on selecting a director for the secretariat and building a committee structure to begin the task of implementation of the 10-Year Plan. Now in its first year, GEO will begin the true work of creating a coordinated and comprehensive global observing system of systems. GEO will have a small staff, supported in part by generous in-kind support provided by its hosts, the WMO and the Swiss Government, and contributions by the member nations. The substantive work products of GEO will be supported by member nations and participating organizations with funding as it is today under the purview of nations and organizations.

The GEO Executive Committee recognizes that without the strong involvement of organizations such as IOC, the GEOSS initiative will not be able to grow and build on the successes of initiatives such as GOOS. Participating organizations are GEO's key source of scientific and technical expertise. As the permanent GEO moves forward, the Executive Committee will ensure that mechanisms are in place to ensure research communities have formal and ongoing input into setting GEO's direction. The U.S. serving as co-chair of the GEO Committee on Tsunami and general hazard warning systems is one example. The Implementation Plan contains hundreds of not just ten-year and six-year goals, but two-year

goals that we will work aggressively to achieve. The new GEO standing and specific warning committees will report to GEO at its second full meeting in December.

Of course, successful implementation requires not just international collaboration among the many stakeholders, but also internal, interagency collaboration in each nation. In the United States, we have created a U.S. Group on Earth Observations to coordinate Earth observation activities and policies across the 15 relevant government agencies and 3 White House offices. One early outcome of the U.S. interagency effort is the recently published Strategic Plan for the U.S. Integrated Earth Observing System.

This strategic plan builds on other interagency coordination efforts, such as the plan for a U.S. Integrated Ocean Observing System (IOOS). IOOS is both the ocean component of the U.S. Integrated Earth Observing Plan and the U.S. component of GOOS—and it all comes together in GEOSS. This degree of coordination presents many challenges, but it is necessary for our efforts to be effective.

Canada, China, Japan, Morocco and South Africa are just some of the countries that I am aware of that have undertaken similar internal coordination initiatives, but I have urged and continue to urge all nations participating in GEO to explore the development of their own national programs.

GEO would not exist today without the high-level political commitment of all of the participating nations. For those of you who have been involved, I thank you and commend you for your efforts. For those who have not, I encourage you to join GEO and get involved in helping us address the ongoing challenges. The IOC has been a leader in transcending national boundaries and building consensus. I am most grateful for IOC participation and support for GEO and GEOSS. The GOOS is a most critical and fundamental component of GEOSS.

Over the next decade, I believe we will look back at this period and recognize what an enormous turning point it represents in the scientific understanding of our planet. The goal of every country participating in GEO is to ensure that this understanding leads to improved operational capabilities that will be put to work for the benefit of people throughout the world and the economies on which they depend. GEOSS will empower science to serve society in ways never before imagined in the history of the world.

Once again, thank you for allowing me to address the relationship between the GEOSS and the GOOS.

C. Closing speech  
by **Dr Patricio Bernal**,  
**Executive Secretary of the Intergovernmental Oceanographic Commission of UNESCO**

30 June 2005

Thank you Chairman.

First of all I am very pleased to report to you that you have a final version of the resolutions adopted at this session. So all of you can have them and take them home. Of course I would like to stress that, all IOC resolutions are important, but this is a special occasion on which the 23rd Assembly of the IOC has taken important measures to establish a global protection against tsunamis and particularly to establish the Indian Ocean tsunami warning system. This is Resolution XXIII-12. It was approved unanimously by the Assembly. It counted

with the strong support from Member States from the region that are taking the lead in setting up this system, but also with strong support from Member States from outside the region. We look forward to a very fast implementation of this resolution. This resolution also establishes an Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning System. This Group will complete as the first phase of its work, the technical design of the system, concentrating on the observational networks to be deployed in the Indian Ocean. How many instruments are needed in each of them and how can their deployment be optimized geographically, to reduce at maximum the time-delays for issuing a warning.

A very important meeting will take place—the first session of the ICG/IOTWS—in Perth in Australia from 3 to 5 August and this gives you just the flavour on which fast track all the implementation of the Indian Ocean Tsunami Warning System is taking place. But the Assembly, Chairman, also adopted three related and very important resolutions.

Resolution XXIII-13 on the Establishment of an Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Connected Seas. This again endorses a very important proposal that had been initially accepted in the previous Executive Council and I think this will move very fast the implementation in that region. And another resolution, Resolution XXIII-14, which is very important for Europe, as it establishes The Intergovernmental Coordination Group for the Tsunami Early Warning System and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas.

So this is giving a very important platform for Member States to put in place systems that will protect their populations from the hazards and risks of tsunamis and enable them to jointly implement and operate them by their contributions to this system.

And the final related resolution I would like to mention individually, because it addresses an important aspect of all the work we are doing, is Resolution XXIII-15, establishing a working group that will have to report back to the coming governing bodies on the establishment of a global framework for tsunami and other ocean-related hazards early-warning systems. And this, as everyone knows and recalls, is very much linked to the establishment of a permanent ocean observing system (GOOS) that we have been pursuing for the last ten years. GOOS provides an important contribution to science and its applications, including several ocean services that today can be based on this new increased observation capacity. Chairman, I think it is important for us to underline this consistency among different programmes of the Commission that adds sustainability to what we do.

The next step, of course, will be the long list of actions coming out from the body of the report itself. We will produce that as soon as possible. We will have a wrap-up session and consultation with the Officers and will communicate to Member States all the important resolutions that are coming from this very important Assembly. I think that we all should be very satisfied with the outcome of this event.

If I may be allowed, I wish to add a couple of things. We have received a very encouraging declaration from the capital of Australia, Canberra, where the Minister of Foreign Affairs expressed his thanks for the leadership that UNESCO has been undertaking and I am very pleased to report this to you. And secondly, Chairman, in the meantime, we continue to consolidate extra-budgetary resources for the funding of this activity. We have received final confirmation from the Irish Government that they will be contributing half a million dollars to this process. I am very grateful for this important additional contribution.

Thank you Chairman.

D. Closing statement  
**by Prof. David Pugh,**  
**Chairman of the Intergovernmental Oceanographic Commission of UNESCO**

30 June 2005

Delegates, Colleagues,

It has been a long road but we are now nearly at the end of this 23rd Assembly of the Intergovernmental Oceanographic Commission of UNESCO. In the past two weeks we have had many debates and made many important decisions. But I think you all understand that in closing I want to emphasize especially the historic work—and I emphasize historic—that we have done on tsunami and on warning systems.

Two weeks ago we came here with converging, yet still separate dreams and aspirations. Now we have arrangements for tsunami warning systems in the Indian Ocean, and we have plans for the Mediterranean, the Atlantic Ocean and the Caribbean. These to be added to the system which already exists for the Pacific Ocean. And we have done more. We have agreed to work together towards a global ocean observing system for all marine hazards. That system should include tsunami and storm flooding of coasts, on one hand, and, on the other, pollution and long-term effects such as sea-level rise. It will not be easy. It will not be quick but it will be done. Now we are all going back to our own countries. We all have work to do but we are doing it together.

Thank you.

ANNEX IV

**UNESCOPRESS RELEASE N°2005-77**

Indian Ocean Tsunami Warning System formally established —  
Work begins on systems for the Caribbean and the Mediterranean

30-06-2005 12:30 pm The Indian Ocean Tsunami Warning and Mitigation System formally came into existence today with the establishment of an Intergovernmental Coordination Group (ICG) to govern it. The 23rd Assembly of UNESCO's Intergovernmental Oceanographic Commission (IOC) also adopted resolutions establishing similar bodies for the Caribbean and adjacent regions as well as the north-east Atlantic, the Mediterranean and connected seas.

Director-General Koïchiro Matsuura welcomed the developments and encouraged participants "to maintain the momentum that has allowed a great deal of progress to be achieved in a few short months." Mr Matsuura also stressed that "UNESCO would continue to support Member States in their efforts to provide the best possible protection for their populations against tsunamis and other ocean-related hazards."

The ICG for the Indian Ocean system will be made up of the IOC's Member States in the region and be supported by a secretariat, provided by the IOC. The Group is expected to hold its first meeting from August 3 to 5, in Perth (Australia).

The Coordination Group will: coordinate IOTWS activities; organize and facilitate data exchange "at or near real time"; promote tsunami research; promote the establishment and further development of national tsunami warning and mitigation capacities; develop, adopt and monitor implementation of work plans of the IOTWS, and identify required resources; promote relevant capacity building; liaise and coordinate with other tsunami warning systems, organizations, programmes and projects; promote the implementation of the warning system within a multi-hazard framework; and constantly scrutinize the status of the system and how it satisfies needs.

The framework for the Indian Ocean Tsunami Warning and Mitigation System was established at two IOC-organized coordination meetings attended by countries from the region, donor nations and institutional partners. They agreed that the system will consist of "a coordinated network of national systems", whose assets would be "owned and operated by the Member States hosting or otherways taking responsibility for them."

The system, work on which has already begun, is expected to be fully operational by July 2006. It will consist of enhanced seismographic networks, networks of real-time sea-level gauges and deep-sea ocean pressure sensors, along with national tsunami warning centres linked to national disaster management systems.

In a fast-track effort to detect the presence or absence of a tsunami after a strong earthquake, the IOC has overseen the installation or upgrading of tide gauges. In addition to recording information about climate and sea-level change, this equipment is already transmitting real-time information that would enable the detection of a tsunami.

The resolutions concerning the Caribbean and the north-east Atlantic and Mediterranean are based on the same lines.

The IOC Assembly also decided to establish a working group to set the framework for a global tsunami and other ocean-related hazards early-warning system.

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ANNEX V

LECTURES

**A. THE BRUUN MEMORIAL LECTURES, 2005**

The Ecology and Oceanography of Harmful Algal Blooms:  
Multidisciplinary Approaches to Research and Management

Donald M. Anderson

Senior Scientist and Coastal Ocean Institute Director, Woods Hole Oceanographic Institution,  
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**Summary**—Harmful algal blooms (HABs), commonly called “red tides” are increasingly common along the coasts of countries throughout the world. These phenomena are caused by the growth and aggregation of algae, both microscopic (phytoplankton) and macroscopic (seaweeds), leading to negative impacts of many types. This presentation reviewed the nature of the HAB problem, the trends in bloom incidence globally, possible causes for the apparent expansion in HAB incidence, and some of the new technologies and approaches that are being used for research and management.

Impacts from HABs can be substantial, affecting public health, fisheries resources (both wild and farmed), local economies, tourism, ecosystem health, and coastal aesthetics. HAB problems include five shellfish poisoning syndromes termed paralytic, diarrhetic, neurotoxic, azaspiracid, and amnesic shellfish poisoning (PSP, DSP, NSP, AZP, and ASP), ciguatera fish poisoning (CFP), farmed and wild fish kills, destructive brown tides, macroalgal overgrowth, and a poorly defined syndrome of human health problems and fish mortalities linked to the dinoflagellates *Pfiesteria* and *Karlodinium*.

One alarming aspect of HAB phenomena relates to their apparent increase in frequency, areal coverage, and diversity over the past several decades. There are now more algal toxins, more toxic algal species, more fisheries resources affected, larger areas affected, and higher economic losses. Reasons for this expansion are many, and include natural species dispersal via storms or currents, human-assisted dispersal (e.g., via ballast water discharge), better toxin detection as a result of increased monitoring and better analytical techniques, and enhancement of bloom populations due to nutrients supplied by sewage, agricultural runoff, and other pollution sources. This latter aspect of the global expansion will receive special attention, with examples given of regions where nutrient increase has resulted in more frequent HABs, and where decreases in sewage and agricultural nutrient inputs have resulted in decreased bloom frequency.

The final section of the presentation highlighted the various methods used to monitor and manage HABs. This will include discussion of some of the newer technologies such as molecular probes for cell detection, rapid and sensitive toxin assays, remote sensing detection and tracking of blooms, and the use of large-scale physical/biological models to analyze past blooms and to forecast future ones.

These are but a few of the many areas where new technologies are being developed to address the serious and growing problem of HABs. There are many opportunities for technological advancements that can lead to better management of resources affected by these fascinating and challenging phenomena.

**Donald M. Anderson** is a Senior Scientist in the Biology Department of the Woods Hole Oceanographic Institution. He earned a doctorate from the Department of Civil Engineering at MIT in 1977 and joined the scientific staff at the Woods Hole Oceanographic Institution in 1978. In 1993, he was awarded the Stanley W. Watson Chair for Excellence in Oceanography. In 2004, he was appointed Director of the Coastal Ocean Institute at the Woods Hole Oceanographic Institution.

Dr Anderson's research focus is on toxic or harmful algal blooms (HABs), commonly called "red tides". Specifically, he studies the physiology and genetic regulation of toxicity in dinoflagellates, their bloom dynamics and ecology, and the global biogeography of toxic algal species. Ongoing research programmes involve the study of large- and small-scale physical and biological mechanisms underlying toxic dinoflagellate blooms, the development of new techniques to identify and quantify these toxic cells and their toxins using molecular "probes", the search for the genes involved in toxin production, development of species-specific indicators of nutrient limitation and cell physiology, and the development of methods to directly control blooms. He served as Project Director for a major ECOHAB field programme involving 14 investigators from 9 institutions who conducted a 5-year field investigation of the ecology and oceanography of toxic *Alexandrium* blooms in the Gulf of Maine, as well as for a programme involving 9 investigators from 4 institutions investigating strategies to directly control Florida red tides. Anderson is also one of the lead investigators in the newly created *Woods Hole Center for Oceans and Human Health*, a national research facility funded by the National Science Foundation and the National Institute of Environmental Health Sciences to explore mechanisms that govern relationships between marine processes and human health.

Along with an active field and laboratory research programme, Anderson is heavily involved in national and international programme development for research and training on red tides, marine biotoxins, and harmful algal blooms (HABs). He serves as Director of the *U.S. National Office for Marine Biotoxins and Harmful Algal Blooms*, located at the Woods Hole Oceanographic Institution (<http://www.whoi.edu/redtide/>). Anderson represents the U.S.A. in many international workshops and committees that deal with these issues, including chairing the IOC Group of Experts which established the IOC's international HAB programme, chairing a SCOR working group on *The Physiological Ecology of Harmful Algal Blooms*, and serving on ICES and PICES HAB working groups. He also serves as an advisor to several foreign countries and international aid organizations on red tides and HABs.

Anderson is the author or co-author of over 180 scientific papers and 10 books.

## B. N.K. PANIKKAR MEMORIAL LECTURES, 2005

### People-Centred Tsunami Early Warning Systems: The Challenge of Building Preparedness at the National and Local Levels

Laura S. L. Kong

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**Summary**—An effective tsunami early-warning system is achieved when all persons in vulnerable coastal communities are prepared and respond appropriately and in a timely manner upon recognition that a potential destructive tsunami may be approaching. While timely tsunami warnings issued by an officially-recognized regional tsunami warning centre using real-time seismic, sea level, and other geophysical data streams from throughout the monitoring region, are an essential component of the system, it is absolutely critical that these scientifically-based warning messages are communicated to the public in an understandable manner that clearly and simply instructs ordinary citizens on the actions they should take to ensure their safety. These actions include the evacuation of people located in areas of potential flooding to safe zones or shelters, along with instructions on who should evacuate, where and how they should go, when to go, what to bring, and how they will know when it will be safe to return. In this regard, pre-disaster tsunami awareness and preparedness are essential activities for educating and familiarizing the public in advance so that they are able to respond immediately and knowledgeably during the actual emergency. The success of any warning system lies in its ability to reach people; e.g., that the people with important specialized knowledge of the impending hazard are able to quickly and efficiently pass on actionable information to all the people who are at risk – although technology is essential for information analysis and delivery, successful early warning ultimately relies on the abilities of people to reach people.

In this lecture, I describe the components of a tsunami early-warning system and how success is achieved through the conduct of people-centred activities which prepare and educate ordinary citizens about the tsunami threat. Tsunami preparedness programmes educate not only the general public, including transient populations such as tourists staying at beachfront hotels, but also government officials and other local community leaders, so that good government emergency-action decisions will be made without delay. The programmes should build capacity and awareness at the local level, place the tsunami hazard and response in the local context, and empower communities to collectively engage in developing an appropriate tsunami response and in pre-disaster mitigation activities.

Specifically, national pre-disaster mitigation programmes must identify vulnerable coastal communities through an assessment of national tsunami risk and implement plans at the local level for tsunami response through the development and widespread publication of evacuation or tsunami safe zone maps along with instructions to the public on how to respond. Engineering and other non-structural countermeasures, such as sea walls, water gates, and vegetative barriers and the design of seismic and tsunami-resistant buildings and critical lifeline infrastructure, to reduce the impact of tsunami on life and property, should also be considered as equally important pre-disaster activities. Finally, social science plays a crucial role in understanding how humans perceive and respond to natural disasters and disaster warnings;

these perceptions must be taken into account to ensure that the tsunami risk is communicated in an understandable and actionable manner to the public.

Early-warning systems can save lives. In particular, a number of activities are critical for an effective system to operate, and can be summarized as follows:

1. Proper instruments which enable the early detection of potentially harmful earthquakes and tsunamis;
2. Warning systems that reliably inform the vulnerable populations immediately and in an understandable way;
3. Awareness activities that enable ordinary citizens to recognize a tsunami so that they know what to do;
4. Preparedness activities which educate and inform a wide populace, including government responders and those providing lifeline and critical infrastructure services, on the procedures and activities that must be taken to ensure public safety;
5. Planning activities which identify and create the public safety procedures and products and build capacity for organizations to respond faster;
6. Strong buildings and safe structures that save lives and reduce property damage that are designed as pre-disaster mitigations;
7. Stakeholder coordination as the essential mechanism that facilitates effective actions in warning and emergency response;
8. High-level advocacy that ensures a sustained commitment to mitigate the impact of infrequent, high-fatality natural disasters such as tsunami.

In summary, an effective system must be able to produce a warning against both locally-generated tsunamis which impact shores immediately, and against distant tsunamis which may take nearly a day to travel across oceans. In building a comprehensive early-warning system, we must ensure that all levels of government understand both the phenomena and the limitations of the technical warning system to accurately predict wave impact, that already-practiced response plans are in place, that an already-educated and prepared public exists, that pre-disaster mitigation to minimize impact has occurred, and finally, that during and afterward, the responsible agencies must be prepared to explain to its highest government leaders and the public how the system worked and why decisions were and were not made to ensure public safety.

**Dr Laura S. L. Kong** has been the Director of the ITIC since 2001. As Director, she oversees a Centre that supports the Intergovernmental Oceanographic Commission of UNESCO in its efforts to implement tsunami warning and mitigation systems globally, and that works directly with the 27-nation International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) to strengthen national tsunami preparedness. Within the United States, she is member of the U.S. National Tsunami Hazard Mitigation Program's Steering Committee and serves as a Tsunami Advisor to Hawaii State Civil Defense. She is a member, and former Chair, of the Hawaii State Earthquake Advisory Committee, and a member of the Hawaii State Hazard Mitigation Forum. Previously, she was a geophysicist at the Pacific Tsunami Warning Centre, and a researcher in volcano and marine seismology at the University of Hawaii's Hawaii Institute of Geophysics, the U.S. Geological Survey's Hawaiian Volcano Observatory, and the University of Tokyo's Earthquake Research Institute. She is a graduate of Brown University and received her doctorate in seismology from the Massachusetts Institute of Technology and Woods Hole Oceanographic Institution in 1990.

## ANNEX VI<sup>2</sup>

### **TERMS OF REFERENCE FOR THE INTERNATIONAL OCEAN CARBON COORDINATION PROJECT**

#### General Description of Activities

IOC and SCOR will provide financing, in-kind assistance, and stewardship for the IOCCP.

The IOCCP will undertake specific tasks (as listed in Specific Terms of Reference, below) and provide ready expertise on ocean carbon observations and research, including ocean carbon sequestration issues, as required by SCOR, IOC, their programmes (e.g., IMBER, SOLAS, OOPC, GOOS, GCOS, and JCOMM) and the IOC Member States.

#### Specific Terms of Reference

- i. To develop an international communication centre on ocean carbon activities through the development and maintenance of Web-based compilations and syntheses of ocean carbon observation and research activities, and through e-mail and/or Web-based newsletters and other publications;
- ii. To provide an international forum for initiatives to promote high-quality observations to understand the ocean component of the global carbon cycle, through international agreements on standards, including:
  - a. Methods/Best Practices
  - b. Quality Control and Quality Assurance Procedures
  - c. Data and Meta-data Formats
  - d. Use of Certified Reference Materials
- iii. To facilitate data collection, management (consistent with data exchange policies of the World Data Centres), data product development, and archival of ocean carbon and related data by:
  - a. Aiding regional and global data syntheses being developed through ocean carbon research programmes, as requested;
  - b. Facilitating and aiding the development of historical data bases for ocean carbon, including data recovery activities, as necessary;
  - c. Ensuring long-term data availability by working with data-management groups and World Data Centres to archive data sets beyond the lifetime of the individual projects.
- iv. To work with global research and observation programmes to promote and document the development and status of a sustained ocean carbon observing system;
- v. To liaise with integrated programmes (IGCO, GCP) to promote the integration of ocean carbon into earth system studies.

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<sup>2</sup> This annex is related to Agenda item 4.2.4 of the Assembly.

ANNEX VII

**REPORT OF THE CHAIRMAN OF THE RESOLUTIONS COMMITTEE**

Mr Geoff Holland (Canada)

Thank you Mr Chairman.

The Technical Committee met many times during the Assembly to review and adjust the Draft Resolutions being considered for adoption. I wish to thank the delegates and members of the IOC Secretariat who assisted in this work, in particular Julian Barbière and Ms Aurora Mateos who kept the documentation under control and dealt with all requirements.

Mr Chairman, I believe the Technical Committee on Resolutions performs a necessary function in the meetings of our Governing Bodies and at the end of this brief review of our work I would like to suggest a paragraph for decision by this Assembly.

The Technical Committee reviewed fifteen Draft Resolutions (DR) and had one DR withdrawn. The DR that was withdrawn was a DR on Ocean Mapping that was submitted by Russia and supported by China, Italy and Portugal. When the work of the Programme and Budget Committee reinstated the funds for Ocean Mapping this DR became redundant and I want to thank the countries concerned for recognizing this. However, may I ask you, Mr Chairman, to ensure that the support expressed for the IOC Ocean Mapping Programme is reflected at the appropriate place in our Summary Report.

This Assembly is addressing several Resolutions dealing with the aftermath of the tsunami disaster last December and in particular the establishment of an Intergovernmental Coordination Group (ICG) for the Indian Ocean. As one could expect, this issue has had high-level political attention, the DR has been a result of extensive negotiations and the Committee was reluctant to make any changes. The Technical Committee also accepted the wishes of the Member States involved to include Annexes containing several of the important governmental statements and declarations already made. These formal attachments will be a part of the final version of the Resolution, although it was obviously unnecessary to send them through the translation process. There were three other related Draft Resolutions, one on the establishment on an ICG for the Caribbean and Adjacent Regions, a similar one for the Atlantic and Mediterranean and a third on the coordination of warning systems into a global network. The Technical Committee found much repetition in the preamble to each of these DRs but realized we did not have enough time to combine these into a combined DR.

As usual, Mr Chairman, many DRs contained paragraphs dealing with the allocation of financial and human resources. The Technical Committee was careful to remove those pertaining to the work of the Programme and Budget Committee, although statements urging the Member States to contribute extra-budgetary support were of course quite appropriate.

In general, the Technical Committee appreciated the practice of numbering the DRs to directly reflect the agenda item each referred to. The Committee also recommends DRs should be clearly dated and any revised drafts also noted.

Finally, Mr Chairman, the Technical Committee noted that our guidelines are sixteen years old and that subsequent calls for revision have not been acted upon. With your approval, I would like to suggest the following paragraph for consideration of the Assembly:

*In the light of his report, **the Assembly instructed** the IOC Executive Secretary to review the procedure and guidelines for the preparation and adoption of the Resolutions of the IOC Governing Bodies, taking into account the current procedure in UNESCO and other related UN bodies and changes in the conduct of IOC meetings and documentation.*

ANNEX VIII

**A — LIST OF MEMBER STATES OF THE IOC EXECUTIVES COUNCIL**

<u>Chairperson</u>	: Professor David T. Pugh (United Kingdom)	Group I
<u>Vice-chairpersons</u>	: Professor Mário Ruivo (Portugal)	Group I
	Dr Alexander V. Frolov (Russian Federation)	Group II
	C. de N. Javier A. Valladares (Argentina)	Group III
	Dr Neville Smith (Australia)	Group IV
	Dr Alfonse M. Dubi (United Republic of Tanzania)	Group V

Other members of the Executive Council

<b>Electoral group I:</b>	Belgium Germany Norway	Canada Greece Turkey	France Italy USA
<b>Electoral group II:</b>	Ukraine		
<b>Electoral group III:</b>	Brazil Cuba Peru	Chile Ecuador Venezuela	Colombia Mexico
<b>Electoral group IV:</b>	China Japan Sri Lanka	India Malaysia Thailand	Indonesia Rep. of Korea
<b>Electoral group V:</b>	Congo Kuwait South Africa	Egypt Mauritius Tunisia	Kenya Nigeria



**B — MEMBER STATES OF THE COMMISSION (132)**  
(as of 27 June 2005)

AFGHANISTAN	(11 March 1991)	LEBANON	(Oct. 1962/Jun. 1964)
ALBANIA	(26 January 1993)	LIBYAN ARAB JAMAHIRIYA	(11 March 1974)
ALGERIA	(Jul. 1964/Nov. 1965)	MADAGASCAR	(Dec. 1965/Oct. 1967)
ANGOLA	(26 October 1982)	* MALAYSIA	(Jul. 1964/Nov. 1965)
* ARGENTINA	(Before November 1961)	MALDIVES	(20 May 1987)
* AUSTRALIA	(Before November 1961)	MALTA	(Oct. 1969/Nov. 1971)
AUSTRIA	(Oct. 1962/Jun. 1964)	MAURITANIA	(Before Nov. 1961)
AZERBAIJAN	(27 January 1998)	* MAURITIUS	(Oct. 1969/Nov. 1971)
BAHAMAS	(29 January 1979)	* MEXICO	(Before Nov. 1961)
BANGLADESH	(29 October 1982)	MONACO	(Before Nov. 1961)
BARBADOS	(18 December 1985)	MOROCCO	(Before Nov. 1961)
* BELGIUM	(Before November 1961)	MOZAMBIQUE	(08 April 1981)
BELIZE	(22 September 1995)	MYANMAR	(07 June 1988)
BENIN	(23 October 1986)	NAMIBIA	(25 April 2001)
* BRAZIL	(Before November 1961)	NETHERLANDS	(Before Nov. 1961)
BULGARIA	(Oct. 1967/Dec. 1969)	NEW ZEALAND	(Nov. 1961/Sep. 1962)
CAMEROON	(Nov. 1971/Nov. 1973)	NICARAGUA	(17 Nov. 1977)
* CANADA	(Before November 1961)	* NIGERIA	(Nov. 1971/Nov. 1973)
CAPE VERDE	(20 August 1984)	* NORWAY	(Before Nov. 1961)
* CHILE	(Before November 1961)	OMAN	(16 November 1982)
* CHINA	(Before November 1961)	PAKISTAN	(Before Nov. 1961)
* COLOMBIA	(Oct. 1967/Dec. 1969)	PANAMA	(Oct. 1967/Sep. 1969)
COMOROS	(08 February 2000)	* PERU	(Dec. 1965/Oct. 1967)
* CONGO	(Nov. 1961/Sep. 1962)	PHILIPPINES	(Oct. 62/Jun. 1964)
COSTA RICA	(28 February 1975)	POLAND	(Before Nov. 1961)
COTE D'IVOIRE	(Before November 1961)	* PORTUGAL	(Oct. 1969/Nov. 1971)
CROATIA	(24 December 1992)	QATAR	(20 July 1976)
* CUBA	(Before November 1961)	* REPUBLIC OF KOREA	(Before Nov. 1961)
CYPRUS	(05 December 1977)	ROMANIA	(Before Nov. 1961)
CZECH REPUBLIC	20 June 2005)	* RUSSIAN FEDERATION	(Before Nov. 1961)
DEMOCRATIC PEOPLE'S		SAINT LUCIA	(14 September 1992)
REPUBLIC OF KOREA	(31 October 1978)	SAMOA	(10 April 1978)
DENMARK	(Before November 1961)	SAUDI ARABIA	(14 June 1978)
DOMINICA	(21 September 1999)	SENEGAL	(Oct. 1967/Sep. 1969)
DOMINICAN REPUBLIC	(Before November 1961)	SERBIA AND	
* ECUADOR	(Before November 1961)	MONTENEGRO	(23 May 2005)
* EGYPT	(Oct. 1969/Nov. 1971)	SEYCHELLES	(27 February 1979)
EL SALVADOR	(16 February 1993)	SIERRA LEONE	(19 April 1974)
ERITREA	(12 November 1993)	SINGAPORE	(Dec. 1965/Oct. 1967)
ESTONIA	(10 March 1992)	SLOVENIA	(16 June 1994)
ETHIOPIA	(05 March 1976)	SOLOMON ISLANDS	(11 May 1982)
FIJI	(09 July 1974)	SOMALIA	(10 July 1974)
FINLAND	(Before November 1961)	* SOUTH AFRICA	(Oct. 1967/Sep. 1969)
* FRANCE	(Before November 1961)	SPAIN	(Before Nov. 1961)
GABON	(26 October 1977)	* SRI LANKA	(Jun. 76/Jan. 1977)
GAMBIA	(30 August 1985)	SUDAN	(26 August 1974)
GEORGIA	(09 July 1993)	SURINAM	(21 January 1977)
* GERMANY	(Before November 1961)	SWEDEN	(Jul. 1964/Nov. 1965)
GHANA	(Before November 1961)	SWITZERLAND	(Before Nov. 1961)
* GREECE	(Oct. 1962/Jun. 1964)	SYRIAN ARAB REPUBLIC	(Oct. 1969/Nov. 1971)
GUATEMALA	(Dec. 1965/Oct. 1967)	* THAILAND	(Before Nov. 1961)
GUINEA	(01 May 1982)	TOGO	(22 October 1975)
GUINEA-BISSAU	(26 January 1984)	TONGA	(03 January 1974)
GUYANA	(20 July 1977)	TRINIDAD & TOBAGO	(Oct. 1967/Sep. 1969)
HAITI	(23 March 1976)	* TUNISIA	(Before Nov. 1961)
ICELAND	(Oct. 1962/Jun. 1964)	* TURKEY	(Nov. 1961/Sep. 1962)
* INDIA	(Before November 1961)	* UKRAINE	(Nov. 1961/Sep. 1962)
* INDONESIA	(Oct. 1962/Jun. 1964)	UNITED ARAB EMIRATES	(02 June 1976)
IRAN, Islamic Republic of	(03 June 1975)	* UNITED KINGDOM OF	
IRAQ	(Oct. 1969/Nov. 1971)	GREAT BRITAIN &	
IRELAND	(07 November 1978)	NORTHERN IRELAND	(Before Nov. 1961)
ISRAEL	(Before November 1961)	* UNITED REPUBLIC OF	
* ITALY	(Before November 1961)	TANZANIA	(Oct. 1967/Sep. 1969)
JAMAICA	(Oct. 1967/Dec. 1969)	* UNITED STATES OF	
* JAPAN	(Before November 1961)	AMERICA	(Before Nov. 1961)
JORDAN	(06 April 1975)	URUGUAY	(Before Nov. 1961)
KAZAKHSTAN	(24 March 2005)	* VENEZUELA	(Oct. 1962/Jun. 1964)
* KENYA	(Nov. 1971/Nov. 1973)	VIET NAM	(Before Nov. 1961)
* KUWAIT	(13 November 1974)	YEMEN	(22 May 1960)

MEMBERS OF THE EXECUTIVE COUNCIL ARE INDICATED WITH AN ASTERISK

## ANNEX IX

## LIST OF DOCUMENTS

Document Code	Title	Agenda Items	Languages available
<b>WORKING DOCUMENTS</b>			
IOC-XXIII/1 prov. rev.2	Second Revised Provisional Agenda	2.1	E F R S
IOC-XXIII/1 Add. prov. rev.2	Second Revised Provisional Timetable	2.4	E only
IOC-XXIII/2	Action Paper	2.1	E F R S
IOC-XXIII/2 Add. & Corr.	Action Paper — Addendum & corrigendum	2.1	E F R S
IOC-XXIII/2 Annex 1	Report by the IOC Executive Secretary on Programme Implementation	3.2	E F R S
IOC-XXIII/2 Annex 1 Add.	Implementation of IOC Governing Bodies' Resolutions	3.2	E F R S
IOC-XXIII/2 Annex 2	Progress Report on Budget Execution (2002–2003, and 2004)	3.2	E F R S
IOC-XXIII/2 Annex 2 rev.	Revised Progress Report on Budget Execution (2002–2003, and 2004)	3.2	E only
IOC-XXIII/2 Annex 2 Add.	Update for the Period 1 January–30 May 2005	3.2	E only
IOC-XXIII/2 Annex 3 rev.	Draft Programme and Budget 2006–2007 (draft 33 C/5)	3.3 & 5.2	E F R S
IOC-XXIII/2 Annex 4	Consolidated Proposal for GSSC, I-GOOS and GPO terms of reference	4.4.1	E F R S
IOC-XXIII/2 Annex 5	Enhancing the Effectiveness of Regional Co-operation in Marine Science and Technology and the Role of the IOC Regional Subsidiary Bodies	4.5.1	E F R S
IOC-XXIII/2 Annex 6	Executive Summary of 'Draft IOC Principles and Strategy for Capacity building'	4.7.1	E F R S
IOC-XXIII/2 Annex 7	Executive Summary of 'Draft Implementation and Business Plan of the IOC Strategy for Capacity-Building'	4.7.2	E F R S
IOC-XXIII/2 Annex 8	"We have a problem"	5.1	E F R S
IOC-XXIII/3 prov.	Draft Summary Report ( <i>to be issued during the Session</i> )	6.	E F R S
IOC-XXIII/4 prov.	Provisional List of Documents ( <i>this document</i> )	2.4	E F R S
IOC-XXIII/5 prov.	Provisional List of Participants ( <i>to be issued during the Session</i> )	--	E/F/S
IOC-XXIII/6	Draft Biennial Report of the Commission on its Activities, 2003–2004	3.4	E F R S
IOC-XXIII/7	Statement of the Chairman on the State of the IOC	3.1	E F R S
<b>REPORTS OF IOC AND COOPERATIVE BODIES REQUIRING ACTION</b>			
IOC/EC-XXXVIII/3	Summary Report of the 38th Session of the IOC Executive Council	2.1	E F R S

<b>Document Code</b>	<b>Title</b>	<b>Agenda Items</b>	<b>Languages available</b>
IOC/IPHAB-VII/3	Executive Summary Report of the Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms (IPHAB), Paris, 16–18 March 2005	4.2.3	E F R S
IOC/IODE-XVIII/3s	Executive Summary Report of the 18th Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE), Ostend, Belgium, 26–30 April 2005	4.3.2	E F R S
WMO-UNEP-IOC/I-GOOS VII/3s	Executive Summary Report of the Seventh Session of the Intergovernmental Committee for the Global Ocean Observing System, Paris, 4–7 April 2005	4.4.2	E F R S
IOC/SC-WESTPAC-VI/3s	Executive Summary Report of the Sixth Session of the IOC Regional Sub Commission for the Western Pacific (WESTPAC), Nha Trang, 23–27 May 2005	4.5.2	E F R S
IOC/ABE-LOS V/3s	Fifth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE–LOS V), Buenos Aires, 11–15 April 2005	4.6.1 4.6.2 4.6.3	E F R S
IOC Workshop Report 196	International Coordination Meeting for the Development of Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework, UNESCO Headquarters, France, 3–8 March 2005	4.8.1 4.8.2	E ( <i>Parts in French</i> )
IOC Workshop Report 198	Second International Coordination Meeting for the Development of Tsunami Warning and Mitigation System for the Indian Ocean, Mauritius, 14–16 April 2005	4.8.1 4.8.2	E ( <i>Parts in French</i> )
United Nations document A/CONF.206/6	Report of the World Conference on Disaster Reduction, Kobe, Hyogo, Japan, 18–22 January 2005	4.8.1	E F S R

#### **INFORMATION AND OTHER REFERENCE DOCUMENTS**

IOC-XXII/3	Summary Report of the Twenty-Second Session of the IOC Assembly, Paris, 24 June–2 July 2003	--	E F R S
IOC/EC-XXXVII/3	Summary Report of the Thirty-Seventh Session of the IOC Executive Council, Paris, 23–29 June 2004	--	E F R S
IOC Annual Report No. 11	IOC Annual Report, 2004	3.2	E only
IOC Annual Report No. 10	IOC Annual Report, 2003	3.2	E only
IOC/INF-1204	IOS Audit Report on the Intergovernmental Oceanographic Commission (IOC): Special Account and controls generally	3.2	E only
IOC/INF-1205	GEOSS Ten-year Implementation Plan; EOS III Resolution; and Communiqué relating to support for tsunami & multi-hazard warning systems	4.1.1	E only
United Nations document A/CONF.207/L.6	Mauritius Declaration of the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Islands Developing States	4.1.2	E F R S

Document Code	Title	Agenda Items	Languages available
United Nations document A/CONF.207/CRP.7	Mauritius Strategy for the further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States	4.1.2	E F R S
IOC/INF-1206	IOC Ocean Sciences Section: Overview and Expected results, 2005	4.2.1	E F
IOC/INF-1207	Background, progress, and future directions for the WMO-IOC-ICSU World Climate Research Programme	4.2.2	E only
IOC/INF-1215 Joint FAO-IOC-WHO Advance Report	Report of the Joint FAO/IOC/WHO ad hoc Expert Consultation on Biotoxins in Bivalve Molluscs, Oslo, Norway, 26–30 September 2004 [short summary]	4.2.3	E F
IOC/INF-1208	Terms of reference and Status of IOC/SCOR Advisory Panel on Ocean Carbon Dioxide	4.2.4	E only
IOC/IODE-XVIII/18	Review of the International Oceanographic Data and Information Exchange (IODE)	4.3.2	E only
IOC/INF-1209	Report by JCOMM Co-Presidents on recent activities, 2005	4.4.3	E F
GCOS-92 (Ex. Sum.) WMO/TD No. 1244	Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC	4.4.4	E only
GCOS-92 WMO/TD No. 1244	Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC [electronic copy only]	4.4.4	E only
IOC/INF-1214 GOOS Report 146	Progress with the Initial Ocean Climate Observing System: A Report to the UNFCCC, April 2005	4.4.4	E F
A/RES/59/24	UN General Assembly Resolution 59/24 on 'The Law of the Sea' (4 February 2005)	4.6.1	E F S R
IOC/INF-1203	IOC Criteria and Guidelines on the Transfer of Marine Technology (CGTMT)	4.6.3	E/F
IOC/INF-1210	Report of the First Inter-Agency Meeting of UN-Oceans	4.6.4	E only
IOC/INF-1211 prov.	Draft IOC Principles and Strategy for Capacity building	4.7.1	E only
IOC/INF-1212	Implementation Plan for Capacity-Building; and Assessment of Best Practices for Capacity-Building	4.7.2	E only
--(document in progress)	Guidelines on Best Practices in Capacity-Building	4.7.2	E only
IOC/EC-XXXVII/2 Annex 15	A Plan for the Use of Remote Sensing in Oceanography by Developing Countries	4.7.3	E F S R
IOC-XXIII/Inf.1	Guidelines for Participants	2	E only
IOC-XXIII/NOM/Inf.1	Updated listing of the IOC electoral groups and listing of the distribution of seats on the Executive Council among the electoral groups	5.3	E only
IOC-XXIII/NOM/Inf.2	Report of the Chairman of the Nominations Committee (to be issued during the Session)	5.3	E only
IOC Technical Series 65	Anton Bruun Memorial Lecture, 2003: Gas-hydrates, a potential source of energy from the oceans	--	E only
IOC Technical Series 66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	--	E only

ANNEX X

LIST OF PARTICIPANTS

**I. OFFICERS OF THE IOC/  
BUREAU DE LA COI/MESA DE LA COI**

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*Chairperson*

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*Vice-Chairperson*

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*Vice-Chairperson*

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*Vice-Chairperson*

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*Vice-Chairperson*

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*Vice-Chairperson*

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*Former Chairperson*

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**II. IOC MEMBER STATES/ETATS  
MEMBRES DE LA COI/ESTADOS  
MIEMBROS DE LA COI**

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**Afghanistan/Afghanistan/Afganistán**

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*Head of Delegation*

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**Albania/Albanie/Albanía**

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**Algeria/Algérie/Algeria**

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Not Represented

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**Angola**

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*Head of Delegation*

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**Argentina/Argentine/Argentina**

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*Head of Delegation*

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*Representatives*

Capt. Ariel Hernán TROISI  
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Mr José Luís FERNANDEZ VALONI  
First Secretary  
Permanent Delegation of Argentina to  
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75015 Paris  
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**Australia/Australie/Australia**

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*Head of Delegation*

Dr Neville SMITH  
Acting Chief of Division  
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G.P.O. Box 1289  
Melbourne, VIC 3001  
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*Alternate*

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*Representatives*

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(*also Rapporteur*)

Cmdr. Andrew McCRINDELL  
Director, Directorate of Oceanography &  
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Royal Australian Navy  
HM Force Element Group  
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*Adviser*

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**Austria/Autriche/Austria**

Not Represented

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**Azerbaijan/Azerbaidjan/Azerbaidjân**

Not Represented

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**Bahamas/Bahamas/Bahamas**

Not Represented

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**Bangladesh/Bangladesh/Bangladesh**

Not Represented

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**Barbados/Barbade/Barbados**

*Head of Delegation*

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**Belgium/Belgique/Bélgica**

*Head of Delegation*

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**Belize/Bélize/Belize**

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**Benin/Bénin/Benin**

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*Head of Delegation*

Mr Hector-Festus POSSET  
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ANNEX XI

**LIST OF ACRONYMS**

ABLOS	Advisory Body on the Law of the Sea (IHO–IAG–IOC)
ACC	Administrative Committee on Coordination [ <i>new name: United Nations System Chief Executives Board for Coordination (CEB).</i> <i>A UN Committee</i> ]
ADG	Assistant Director-General (UNESCO)
ADPC	Asian Disaster Preparedness Centre
ADRC	Asian Disaster Reduction Centre
ALD	Appointment of limited duration (UNESCO)
AOSIS	Alliance of Small Island States
Argo	GODAE global profiling float project [ <i>not an acronym</i> ]
ASEAN	Association of South East Asian Nations
ASP	Amnesic Shellfish Poisoning [ <i>HAB terminology</i> ]
ATWC	Atlantic Tsunami Warning Centre
AZP	Azaspiracid poisoning [ <i>HAB terminology</i> ]
BILKO	Virtual global faculty for remote sensing Project (UNESCO)
CARIACO	Carbon Retention in a Coloured Ocean (Venezuela)
CBD	Convention on Biological Diversity [ <i>Adopted in Rio de Janeiro, 1992</i> ]
CCFFP	Codex Committee on Fish and Fisheries Products (FAO–WHO)
CEOS	Committee on Earth Observing Satellites (European Commission)
CFP	Ciguatera fish poisoning [ <i>HAB terminology</i> ]
CGCB	Consultative Group on Capacity-Building (IOC)
CGTMT	Criteria and Guidelines on the Transfer of Marine Technology (IOC)
CLiC	Climate and Cryosphere Programme (WMO)
CLIVAR	Climate Variability and Predictability
CoML	Census of Marine Life
COOP	Coastal Ocean Observations Panel (GOOS)
COP	Conference of the Parties (to the United Nations Framework Convention on Climate Change)
COSPAR	Committee on Space Research (ICSU)
CPPS	Permanent Commission for the South Pacific
DBCP	Data Buoy Cooperation Panel
DNA	Designated National Agency
DOALOS	Department of Ocean Affairs and the Law of the Sea (UN)
DR	Draft Resolution (IOC)
DSP	Diarrhetic Shellfish Poisoning [ <i>HAB terminology</i> ]
EC	Executive Council (IOC)
ECOHAB	Ecology and Oceanography of Harmful Algal Blooms
EEZ	Exclusive Economic Zone
EOS	Earth Observation Summit
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)
ETDMP	Expert Team on Data Management Practices
EU	European Union
EuroGOOS	European Regional GOOS (IOC)
FAO	Food and Agriculture Organization of the United Nations
FMAP	Future of Marine Animal Populations (CoML)
GCOS	Global Climate Observing System (WMO–ICSU–IOC–UNEP)

GCOSIP	GCOS Implementation Plan
GCP	Global Carbon Project
GEF	Global Environment Facility (World Bank–UNEP–UNDP)
GEO	Group on Earth Observations [ <i>ad hoc intergovernmental group</i> ]
GEOHAB	Global Ecology and Oceanography of Harmful Algal Blooms (IOC–SCOR)
GEOSS	Group on Earth Observation System of Systems
GIS	Geographic Information System
GLOSS	Global Sea Level Observing System (IOC)
GMA	Global Marine Assessment
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System (IOC–WMO–UNEP–ICSU)
GOOS–AFRICA	African Global Ocean Observing System
GOSUD	Global Ocean Surface Underway Profile Programme (IODE)
GPO	GOOS Project Office (IOC)
GPS	Global Positioning System
GRAND	GOOS Regional Alliances Network Development Project
GRA	GOOS Regional Alliance
GSSC	GOOS Scientific Steering Committee (I-GOOS)
GTS	Global Telecommunication System (WMO)
HAB	Harmful Algal Blooms (IOC)
HFA	Hyogo Framework for Action (WCDR)
HMAP	History of Marine Animal Populations
IABO	International Association of Biological Oceanography
IACOMS	International Advisory Committee on Marine Sciences
IAG	International Association of Geodesy
ICAM	Integrated Coastal Area Management Programme (IOC)
ICES	International Council for the Exploration of the Sea
ICG	International Coordination Group
ICP	Informal Consultative Process (UN)
ICSU	International Council for Science [ <i>formerly International Council of Scientific Unions</i> ]
IFRC	International Federation of Red Cross and Red Crescent Societies
IGBP	International Geosphere–Biosphere Programme (ICSU)
IGCO	Integrated Global Carbon Observation
I–GOOS	Intergovernmental Committee for GOOS (IOC—WMO—UNEP)
IHO	International Hydrographic Organization
IHP	Intergovernmental Council of the International Hydrological Programme (UNESCO)
IMAGES	International Marine Aspects of Global Change (IGBP)
IMBER	Integrated Marine Biogeochemistry and Ecosystem Research Project (SCOR–IGBP)
IMDIS	International Marine Data and Information System (conference, France)
IMO	International Maritime Organization
INF	IOC Information document
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOC/ABE-LOS	IOC Advisory Body of Experts on the Law of the Sea
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCCP	International Ocean Carbon Coordination Project
IOCEA	IOC Regional Committee for the Central Eastern Atlantic

IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IOCWIO	IOC Regional Committee for the Western Indian Ocean
IODE	International Oceanographic Data and Information Exchange (IOC)
IOI	International Ocean Institute
IOOS	Integrated Ocean-Observing System (USA)
IOS	Internal Oversight Service (UNESCO)
IOTWS	Indian Ocean Tsunami Warning and Mitigation System (IOC)
IPCC	Intergovernmental Panel on Climate Change
IPHAB	Intergovernmental Panel on Harmful Algal Blooms (IOC)
IPY	International Polar Year
ISDR	International Strategy for Disaster Reduction (UN)
ITIC	International Tsunami Information Centre (IOC)
ITSU	Tsunami Warning System in the Pacific (IOC)
JCADM	Joint Committee on Antarctic Data Management
JMA	Japan Meteorological Agency
JCOMM	IOC–WMO Joint Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM Observing Platform Support
LME	Large marine ecosystem
MIM	Mauritius International Meeting to Review Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States
MIT	Massachusetts Institute of Technology
MLA	Main Lines of Action [ <i>UNESCO budgetary designation</i> ]
MOU	Memorandum of Understanding
NDWC	National Disaster Warning Centre (Thailand)
NEAMTWS	Tsunami Early Warning System in the North-east Atlantic and the Mediterranean and Connected Seas
NEPAD	New Partnership for Africa’s Development
NGO	Non-Governmental Organization
NMHS	National Meteorological and Hydrological Services
NOAA	U.S. National Oceanic and Atmospheric Administration
NODC	National Oceanographic Data Centre (IODE)
NSP	Neurotoxic shellfish poisoning [ <i>HAB terminology</i> ]
NWPTIC	Northwest Pacific Tsunami Information Centre (Japan)
OBIS	Ocean Biogeographic Information System (CoML)
OCEATLAN	Regional alliance covering the tropical and southwestern Atlantic Ocean
OCHA	Office for the Coordination of Humanitarian Affairs (UN)
ODIMeX	Integrated Expert and Training System for Oceanographic Data and Information Management (IOC/IODE)
ODIN	Oceanographic Data and Information Network (IOC/IODE)
ODINAFRICA	Ocean Data and Information Network for Africa (IOC/IODE)
ODINCARSA.	Ocean Data and Information Network for the Caribbean and South America Regions (IOC/IODE)
ODINCINDIO	ODIN for the IOCINDIO region (IODE)
OLA	Office of Legal Affairs (DOALOS)
OOPC	Ocean Observations Panel for Climate (GCOS)
OTEC	Ocean Thermal Energy Conversion
PICES	North Pacific Marine Science Organization
PI-GOOS	Pacific Islands GOOS

PORSEC	Pan-Ocean Remote Sensing Conference
PSP	Paralytic shellfish poisonings [ <i>HAB terminology</i> ]
PTWC	Pacific Tsunami Warning Centre (IOC)
RNODC	Responsible National Oceanographic Data Centre (IOC/IODE)
RV	Research vessel
SBSTA	Subsidiary Body for Scientific and Technological Advice (UNESCO)
SCOR	Scientific Committee on Oceanic Research (ICSU)
SEAGOOS	South-East Asian Regional GOOS
SERREAD	Scientific Educational Resources and Experience with Deployment of Argo Floats in the Pacific
SeaWiFS	Sea-viewing, Wide-Field-of-view Sensor (USA)
SIDS	Small Island Developing States
SMS	Short Message Service
SOCA	Sub-Committee on Oceans and Coastal Areas (ACC)
SOLAS	Surface-Ocean Lower Atmosphere Study (NOAA/CMDL)
SOPAC	South Pacific Applied Geoscience Commission
TMT	Transfer of marine technology
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UN–Oceans	United Nations Oceans and Coastal Areas Network
UNU	United Nations University
USA	United States of America
USAID	United States Agency for International Development
WAPMERR	World Agency of Planetary Monitoring and Earthquake Risk Reduction
WCR	Wider Caribbean Region (UNEP)
WCRP	World Climate Research Programme (WMO–IOC–ICSU)
WESTPAC	IOC Sub-Commission for the Western Pacific (IOC)
WHO	World Health Organization
WIOMAP	Western Indian Ocean Marine Applications Project
WIOMSA	Western Indian Ocean Marine Science Association
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment (WMO–IOC–ICSU/WCRP)
WSSD	World Summit on Sustainable Development
XBT	Expendable bathythermograph
XML	Extensible mark-up language
ZNG	Zero Nominal Growth [ <i>budgetary scenario</i> ]

61.	Third Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1995	E only
62.	Fifteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Papetee, 1995	E, F, S, R
63.	Third Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1995	E, F, S
64.	Fifteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange	E, F, S, R
65.	Second Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	English only
66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	English only
67.	Fifth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Christ Church, 1995	E, S
68.	Intergovernmental Meeting on the IOC Black Sea Regional Programme in Marine Sciences and Services	E, R
69.	Fourth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, 1995	E, F, S
70.	Twenty-ninth Session of the Executive Council, Paris, 1996	E, F, S, R
71.	Sixth Session for the IOC Regional Committee for the Southern Ocean and the First Southern Ocean Forum, Bremerhaven, 1996	E, F, S
72.	IOC Black Sea Regional Committee, First Session, Varna, 1996	E, R
73.	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Fourth Session, Mombasa, 1997	E, F
74.	Nineteenth Session of the Assembly, Paris, 1997	E, F, S, R
75.	Third Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1997	E, F, S, R
76.	Thirtieth Session of the Executive Council, Paris, 1997	E, F, S, R
77.	Second Session of the IOC Regional Committee for the Central Indian Ocean, Goa, 1996	E only
78.	Sixteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Lima, 1997	E, F, S, R
79.	Thirty-first Session of the Executive Council, Paris, 1998	E, F, S, R
80.	Thirty-second Session of the Executive Council, Paris, 1999	E, F, S, R
81.	Second Session of the IOC Black Sea Regional Committee, Istanbul, 1999	English only
82.	Twentieth Session of the Assembly, Paris, 1999	E, F, S, R
83.	Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1999	E, F, S, R
84.	Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 1999	E, F, S, R
85.	Fourth Session of the IOC Sub-Commission for the Western Pacific, Seoul, 1999	English only
86.	Thirty-third Session of the Executive Council, Paris, 2000	E, F, S, R
87.	Thirty-fourth Session of the Executive Council, Paris, 2001	E, F, S, R
88.	Extraordinary Session of the Executive Council, Paris, 2001	E, F, S, R
89.	Sixth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, San José, 1999	English only
90.	Twenty-first Session of the Assembly, Paris, 2001	E, F, S, R
91.	Thirty-fifth Session of the Executive Council, Paris, 2001	E, F, S, R
92.	Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Lisbon, 2000	E, F, S, R
93.	Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Cartagena, 2001	E, F, S, R
94.	Fifth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2001	E, F, S, R
95.	Seventh session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Mexico 2002	E, S
96.	Fifth Session of the IOC Sub-Commission for the Western Pacific, Australia, 2002	E only
97.	Thirty-sixth Session of the Executive Council, Paris, 2003	E, F, S, R
98.	Twenty-second Session of the Assembly, Paris, 2003	E, F, S, R
99.	Fifth Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Kenya, 2002 (*Executive Summary available separately in E, F, S, R)	E*
100.	Sixth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, St. Petersburg, Florida (USA), 2002 (*Executive Summary available separately in E, F, S, R)	E*
101.	Seventeenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 2003 (*Executive Summary available separately in E, F, S, R)	E*
102.	Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2003 (*Executive Summary available separately in E, F, S, R)	E*
103.	Nineteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Wellington, New Zealand, 2003 (*Executive Summary available separately in E, F, S & R)	E*
104.	Third Session of the IOC Regional Committee for the Central Indian Ocean, Tehran, Islamic Republic of Iran, 21-23 February 2000	E only
105.	Thirty-seventh Session of the Executive Council, Paris, 2004	E, F, S, R
106.	Seventh Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2005 (*Executive Summary available separately in E, F, S & R)	E*
107.	First session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation system (ICG/IOTWS), Perth, Australia, 3-5 August 2005	E only
108.	Twentieth Session of the Intergovernmental Coordination Group for the Tsunami Warning System in the Pacific, Viña del Mar, Chile, 3-7 October 2005 (*Executive Summary available separately in E, F, S & R)	E*
109.	Twenty-third Session of the Assembly, Paris, 21-30 June 2005	E, F, S, R