

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies



IOC Sub-Commission for the Western Pacific

Ninth Session

Busan, Republic of Korea
9–12 May 2012

UNESCO

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* An executive summary of this report in English is available online
referenced IOC/SC-WESTPAC-IX/3s.

TABLE OF CONTENTS

	page
1. OPENING	1
2. ADMINISTRATION	2
2.1 ADOPTION OF THE AGENDA.....	2
2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION.....	3
2.3 CONDUCT OF THE SESSION.....	3
3. REPORT ON INTERSESSIONAL ACTIVITIES	4
3.1 REPORT ON INTERSESSIONAL ACTIVITIES.....	4
3.1.1 <i>Statement of the Chairperson</i>	4
3.1.2 <i>Report by the Regional Office on Intersessional Activities and Budget Overview</i>	4
3.1.3 <i>Operation of the IOC Regional Office for WESTPAC</i>	6
3.2 RECENT DEVELOPMENTS WITHIN IOC/UNESCO, AND ITS RELEVANCE TO WESTPAC.....	7
4. POLICY ISSUES	8
4.1 PERSPECTIVES OF IOC ON THE FUTURE DEVELOPMENT OF THE SUB-COMMISSION.....	8
4.2 WESTPAC OCEAN RESEARCH PRIORITY PLAN.....	8
4.3 THE EIGHTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM IN 2011, REPUBLIC OF KOREA, WITH FOCUS ON LESSON LEARNT.....	9
4.4 THE PREPARATIONS FOR THE NINTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM, VIETNAM 2014.....	9
4.5 CELEBRATING THE TWENTY-FIFTH ANNIVERSARY OF WESTPAC.....	10
5. REVIEW AND EVALUATION OF REGIONAL PROGRAMMES, PROJECTS AND WORKING GROUPS FOR MAY 2010–MAY 2012	11
5.1 MARINE SCIENCE AND APPLICATIONS.....	11
5.1.1 <i>Harmful Algal Blooms</i>	11
5.1.2 <i>Ocean Remote Sensing</i>	11
5.1.3 <i>Response of Marine Hazards to Climate Change</i>	11
5.1.4 <i>South China Sea Fluvial Sediments and Environment Changes</i>	12
5.1.5 <i>Marine and Coastal Biodiversity and its Management</i>	12
5.1.6 <i>Coral Reef under Climate and Anthropogenic Perturbations</i>	13
5.1.7 <i>Toxic Marine Organisms</i>	13
5.1.8 <i>DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms</i>	14

	page
5.2 OCEAN OBSERVATIONS AND SERVICES	14
5.2.1 North East Asian Regional-GOOS	14
5.2.2 South East Asian Regional-GOOS, including Monsoon Onset Monitoring and its Social and Ecosystem Impacts, Ocean Forecasting Demonstration System	14
5.2.3 Marine Hazards Forecasting and Mitigation in the Western Pacific	15
5.2.4 International Bathymetric Chart of the Western Pacific	16
5.2.5 Ocean Data & Information Network for the Western Pacific	16
5.3 CAPACITY BUILDING AND PUBLIC AWARENESS	17
5.3.1 UNESCO/IOC Regional Network of Training and Research Centers on Marine Science in the Western Pacific	17
5.3.2 IOC Regional Training and Research Center on Ocean Dynamics and Climate	17
5.3.3 IOC-WMO Regional Marine Instrument Center for the Asia and Pacific	18
5.4 WESTPAC WORKING GROUPS	19
5.4.1 Working Group on Asian Dust and its Impact on Ocean Ecosystem	19
5.4.2 Working Group on Regular Process for Global Reporting and Assessment of the State of the Marine Environment	19
5.5 REVIEW OF ON-GOING PROJECTS AND WORKING GROUPS BY THE WESTPAC ADVISORY GROUP	20
6. REVIEW AND APPROVAL OF NEW PROJECT AND WORKING GROUP PROPOSALS	20
6.1 AIR-SEA INTERACTION IN THE KUROSHIO EXTENSION AND ITS CLIMATE IMPACT	20
6.2 MAPPING THE HARMFUL JELLYFISHES IN THE TROPICAL WESTERN PACIFIC	21
6.3 MARINE RENEWABLE ENERGY TECHNOLOGY DEVELOPMENT IN THE WESTERN PACIFIC	21
7. CO-OPERATION WITH OTHER ORGANIZATIONS	22
8. WESTPAC PROGRAMME AND BUDGET FOR MAY 2012–MAY 2014	23
9. OTHER MATTERS	23
10. ELECTIONS	23
11. DATE AND PLACE OF THE NEXT SESSION	24
12. ADOPTION OF SUMMARY REPORT AND RECOMMENDATIONS	24
13. CLOSURE	24

ANNEXES

- I. AGENDA
- II. LIST OF ADOPTED RECOMMENDATIONS
- III. OPENING REMARKS
- IV. LIST OF DOCUMENTS
- V. LIST OF PARTICIPANTS
- VI. LIST OF ACRONYMS

1. OPENING

- 1 The Ninth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-IX) was convened at 10:00 a.m. on Wednesday, 9 May 2012 at the Paradise Hotel, Busan, Republic of Korea. The Session was organized by the IOC Regional Office for WESTPAC (WESTPAC Office), and hosted by the Ministry of Land, Transport and Maritime Affairs (MLTM) and the Korea Ocean Research and Development Institute (KORDI) of the Republic of Korea.
- 2 At the opening ceremony, on behalf of the National Organizing Committee for WESTPAC-IX and Dr Jung-Keuk Kang, President of KORDI, Dr Weong-Seo Kim, Vice-President of KORDI, welcomed all delegates and representatives from the Member States, international organizations and programmes to the Session. Dr Kim confirmed KORDI's commitment to WESTPAC with its efforts to be invested on the improvement of the regional capability in marine forecasting and prediction, and the study of marine genetics. These efforts will allow the region to better prepare for and respond to natural disasters, as well as provide further information on the connectivity between physical and biological functions in the marine ecosystem. As the Western Pacific region is an area of high marine productivity, it is hoped that WESTPAC will initiate a regional scale programme encompassing physical, biological, geological and chemical oceanography that will be beneficial to all Member States.
- 3 Mr Sung-Ho Joo, Vice-Minister of MLTM, welcomed all participants to Busan. He congratulated WESTPAC for contributing to enhancing the capabilities of ocean observation, exchange and sharing of observed data and information, and ecosystem research. He noted that the oceans provide a considerable amount of resources on which humans depend and these resources are being threatened by pollution, climate change, and other changes to the ocean ecosystem. Mr Joo confirmed the Republic of Korea's dedication to pursuing continued research in marine sciences, particularly biodiversity, genetics, ocean observation, and impacts of climate change. He encouraged all participants to visit the Expo 2012 Yeosu which is serving as a platform to showcase and present current findings on the status of marine ecosystems. In closing, Mr Joo thanked KORDI, WESTPAC Office and the City of Busan for their efforts in organizing the meeting, and wished the meeting full success.
- 4 Dr Wendy Watson-Wright, IOC Executive Secretary, speaking on behalf of the Commission and Director-General of UNESCO, congratulated WESTPAC for exceeding her expectations and fully demonstrating its indispensable role in delivering and expanding the service of IOC to Member States in the region due to the joint efforts of Member States and WESTPAC Office. She noted that WESTPAC has made a number of exemplary contributions through a variety of regionally-specific activities in support of IOC's global efforts. These include: supporting the 50th anniversary celebration of IOC, the Regular Process for Global Reporting and Assessment of the State of Marine Environment (Regular Process), the development of the Global Ocean Observing system (GOOS) and IOC self-driven capacity building. Dr Watson-Wright highlighted the unique regional capacity building initiative, titled "IOC Regional Network of Training and Research Centers on Marine Science," which was initiated for the first time in IOC, representing the strong commitment of the Member States in the region to promote North-South and South-South cooperation, and providing valuable experience to be shared with other regions.
- 5 Dr Watson-Wright pointed out some opportunities which IOC has remained engaged in, including: the Rio+20 Conference on Sustainable Development where oceans were given a high profile allowing IOC and Member States to participate in forthcoming work on improving the sustainability of human relationships with the ocean; the Expo 2012 Yeosu where IOC partnering with ICES, PICES, and WMO will convene the Second ICES-PICES-IOC International Symposium on the "Effect of Climate Change on the World's Oceans" (15–19 May 2012), and the Fourth Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-IV, 23–31 May 2012). Dr Watson-Wright also mentioned that

UNESCO and IOC are facing severe financial challenges that may result in IOC risking losing its recognized global leadership in ocean sciences, observations, data management, and services. To this end, it is critically important that WESTPAC, a regional arm of IOC, assists IOC by working very closely with Member States in the region to overcome the difficulties IOC faces and strengthen the presence of IOC in the region. While noting with appreciation the ever rising spirit of cooperation reflected in and considerable contribution from Member States to WESTPAC, she expected these efforts will continue into the future to the greatest extent possible. In closing, she thanked the Republic of Korea and the Organizing Committee for the exceptional hospitality and hosting the Session in Busan.

6 On behalf of Dr Zhanhai Zhang, Chairperson of WESTPAC, Dr Yasuwo Fukuyo, First Vice-Chair of WESTPAC, welcomed all participants and thanked the government of Republic of Korea for hosting the Session. He congratulated WESTPAC for its achievements during the past two decades, particularly since 2008 with the development of the new strategy and programme structure that has resulted in the formulation of new initiatives. The influence and visibility of WESTPAC has been raised considerably and is now one of the most active programmes in the region. Dr Fukuyo expressed appreciation to the Member States for their in-kind and in-cash contributions to WESTPAC, to WESTPAC Office for its creative and hard work, and IOC of UNESCO for its continuing support. In closing, Dr Fukuyo mentioned that the year 2012 is special for the ocean with the convening of various large international events such as Expo 2012 Yeosu. Such events offer further opportunities for IOC and WESTPAC to enhance their roles and functions in contributing knowledge and capacity building to the international marine science community.

7 The Vice-Mayor of Busan City, Mr Young-Hwal Lee expressed his appreciation to MLTM, KORDI, and the WESTPAC Office for once again holding an important WESTPAC event in Busan. He welcomed representatives of MLTM, IOC, WESTPAC, and all delegates to Busan. Busan is an important port city as well as the host of the annual World Ocean Forum which facilitates exchange and cooperation among global ocean industry professionals. Mr Lee confirmed Busan's commitment to active participation in developing ocean science and technology. As with other speakers, Mr Lee congratulated WESTPAC on its achievements in global observation, and expected WESTPAC to further promote international cooperation for a healthier and wealthier ocean ecosystem.

8 The complete statements made at the opening ceremony are provided as [Annex III](#).

2. ADMINISTRATION

2.1 ADOPTION OF THE AGENDA

9 Dr Fukuyo began the agenda by regretfully informing the meeting that due to health reasons, Dr Zhanhai Zhang, WESTPAC Chairperson, was unable to chair the Session. Instead, as the First Vice-Chair, he would take on the task, serving as acting Chairperson for the Session.

10 Mr Wenxi Zhu, Technical Secretary for the Session, introduced the Provisional Agenda (Document IOC/SC-WESTPAC-IX/2 prov.) and the Provisional Annotated Agenda (Document IOC/SC-WESTPAC-IX/3 prov.) for consideration by the participants. He explained that the Session would be conducted on 9–11 May with 12 May 2012 scheduled for the field trip to the Expo 2012 Yeosu Korea: the Living Ocean and Coast, providing an opportunity for participants to view the achievements of and future models for the promotion of the state-of-the-art marine science, technology and marine industries. In this case, there would probably not have adequate time for the WESTPAC Office to prepare the full text of the Session Summary Report as has been the past practice. He thus invited the Sub-Commission to consider approving action points and recommendations at this Session, leaving the full text of the full report to be approved by correspondence after the Session.

11 A suggestion was made by the delegation of Japan to include one item concerning the celebration of the Twenty-fifth Anniversary of WESTPAC. This event should take stock of the advances and chart the future in marine sciences and related international cooperation in the Western Pacific. It would also promote the value and importance of the Sub-Commission's achievements. It was suggested to include this as an additional agenda item, namely 4.5 and to establish a sessional working group to address the issue and report back to the plenary on the last day of the meeting.

12 The suggestion was accepted by the Session. **The Sub-Commission adopted** the Agenda with the suggested change, which is attached as [Annex I](#) to this report.

2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION

13 Dr Fukuyo invited the Sub-Commission to designate the Rapporteur for the Session to assist acting Chairperson and the WESTPAC Office in the preparation of the Session Summary Report. China proposed Thailand to serve as Rapporteur which was seconded by Japan.

14 **The Sub-Commission accepted** the proposal and **welcomed** Dr Somkiat Khokiattiwong from the delegation of Thailand to serve as the Rapporteur.

2.3 CONDUCT OF THE SESSION

15 Mr Zhu introduced the Provisional Timetable (Document IOC/SC-WESTPAC-IX/2 add. prov.) and the Provisional List of Documents (Document IOC/SC-WESTPAC-IX/1 prov.), and pointed out that the meeting would be organized in plenary as much as possible with sessional working groups to be formed to deal with specific items arising from the discussions. These include two Sessional Working Groups, respectively for the Twenty-fifth Anniversary of WESTPAC, and the Ninth WESTPAC International Scientific Symposium to be held in Vietnam in 2014. He also reminded all delegations that the final deadline for the submission of nominations for the elections of the WESTPAC Officers was Thursday, 10 May 2012 at 12:00 p.m., and the deadline for the submission of draft recommendations was Friday, 11 May 2012 at 10:40 a.m.

16 The acting Chairperson invited the Session to establish the two statutory sessional committees: 1) Nomination Committee; and 2) Recommendation Committee.

17 The delegation of Vietnam proposed China to chair the Nomination Committee, which was seconded by Malaysia and duly accepted by China. Russia nominated Japan to Chair the Recommendation Committee. This was seconded by Malaysia and accepted by Japan.

18 Japan nominated Malaysia to chair the Sessional Working Group on the Twenty-fifth Anniversary of WESTPAC to come up with a preliminary list of commemorative activities. This was supported by numerous delegations and accepted by Malaysia. The Republic of Korea and Indonesia proposed Vietnam, as the host of the next Scientific Symposium, to Chair the Sessional Working Group for this event which was accepted by Vietnam.

19 **The Sub-Commission noted** the working modality of the Session and the allotted time for each agenda item. **The Sub-Commission also noted** the deadlines for the submission of nominations and draft Recommendations.

20 The List of Documents, List of Participants and List of Acronyms are attached as [Annexes IV, V and VI](#), respectively.

3. REPORT ON INTERSESSIONAL ACTIVITIES

3.1 REPORT ON INTERSESSIONAL ACTIVITIES

3.1.1 Statement of the Chairperson

21 As the acting Chairperson, Dr Fukuyo delivered the Chairperson's statement (Document IOC/SC-WESTPAC-IX/5), speaking about the recent developments of the Sub-Commission and the outlook for the coming years.

22 He congratulated WESTPAC for its recent extensive work in the region and having become one of the most active subsidiary bodies of IOC. The following efforts have allowed WESTPAC to achieve its current success: 1) a reformed programme structure and the initiation of many new regional cooperative activities in ocean research, capacity building, and information exchange; 2) effective and efficient communication means between Member States and the WESTPAC Office, with Member States providing additional in-cash and in-kind support to WESTPAC activities; 3) development of the regional specific capacity building initiative "IOC Regional Network of Training and Research Centers on Marine Science" with the establishment of the first regional research and training centre in Qingdao, China, and more regional centers to be set up throughout the region; 4) increased participation in and contribution by WESTPAC to international and regional events such as GOOS, Regular Process, and Expo 2012 Yeosu (Republic of Korea).

23 With respect to the future work, Dr Fukuyo further encouraged WESTPAC and its mother organization, IOC, to make further efforts to increase its influence and visibility at the international level. He called on IOC and Member States to address the understaffed situation of the WESTPAC office by adding more regular posts and upgrading the rank of staff of the Office. With the continued support of Member States, he was confident that WESTPAC's programmes will continue to prosper.

3.1.2 Report by the Regional Office on Intersessional Activities and Budget Overview

24 Mr Zhu reported on the progress during the last intersessional period, particularly on the implementation of the Sub-Commission's adopted recommendations and Programme and Budget for May 2010–May 2012, since the last session of the WESTPAC in Bali, Indonesia (Documents IOC/SC-WESTPAC-IX/6). He presented the great changes of WESTPAC as seen today as a result of joint revitalization efforts, including:

- a systematic framework and collaborative process for concerting the efforts of Member States through the development, establishment, implementation and completion of regionally-specific country driven programs/projects;
- an advisory mechanism in operation to provide scientific and technical advice on the development, planning and implementation of WESTPAC activities;
- a complementary implementing mechanism in place to WESTPAC programmes/projects to ensure the timely response of WESTPAC to marine-related emerging regional/international issues;
- a self-driven and sustainable capacity building initiative "IOC Regional Network of Training and Research Centres on Marine Science" under implementation to enhance national and regional capacities by utilizing the current and explore potential capacity in the region;

25 Mr Zhu further explained that with the strategic planning and collaborative processes, WESTPAC has been taking on a new look to the regional and global science community. This is evidenced through the large participation in her activities. An estimated 1,400 marine scientists, officials and managers took part directly in WESTPAC activities during the last intersessional

period mainly through: one WESTPAC International Scientific Symposium, four Joint Cruises, 11 Trainings/Summer Schools, and 27 Regional Workshops/Consultative Meetings.

26 While briefing the meeting that all five recommendations adopted by the Sub-Commission at its last session were fully implemented, Mr Zhu highlighted the major accomplishments achieved over the last intersessional period, which include:

- The organization of the Eighth WESTPAC International Scientific Symposium entitled “Ocean Climate and Marine Ecosystems in the Western Pacific,” 28–31 March 2011, Busan, Republic of Korea, with the kind host of the Government of Republic of Korea. The symposium featured eleven concurrent sessions and eight workshops with the participation of around 500 participants. Five prestigious scientists and one national agency were awarded the IOC Fiftieth Anniversary Certificate. The WESTPAC Young Scientist Award was established for the first time with four young scientists selected for their exemplary oral or poster presentations, and each awarded a free round trip ticket for their participation in the next WESTPAC International Scientific Symposium;
- The materialization of the self-driven, regionally specific capacity building initiative “IOC Regional Network of Training and Research Centres on Marine Sciences” with the establishment and operation of the first IOC Regional Training and Research Centre on Ocean Dynamics and Climate (ODC Centre) and several other regional training and research centres under development with Member States who have expressed their willingness and positive response. The ODC Centre has started to provide regular trainings with its first one on ocean models, 10–16 June 2011 with 69 trainees from 10 countries, and the second training course on ocean dynamics scheduled for 16–21 July 2012;
- The development of the South East Asian-Global Ocean Observing System (SEAGOOS) with two pilot projects initiated and implemented, respectively on “Monsoon Onset Monitoring and its Social & Ecosystem Impact (MOMSEI)” and “Ocean Forecasting Demonstration System (OFDS)” with joint cruises conducted, summer schools organized and the website for the Ocean Forecasting Demonstration System in operation;
- Strengthened capacity building efforts with a series of trainings, besides the regular training provided from the IOC Regional Network of Training and Research Centres, developed and conducted by respective programmes with focus on the rapid assessment survey methodologies for detecting marine non-Indigenous species, MOMSEI Summer School, impact of sediment and water quality on coral reef, taxonomy and ecology of diatom *Pseudo-nitzschia* and Immunological method for detection of domoic acid in plankton and shellfish;
- Enhanced cooperation with global and other regional programmes within and outside IOC. For instance, the joint organization of the trainings on the rapid assessment survey methodologies for detecting marine non-indigenous species with the North Pacific Marine Science Organization (PICES) and the UNEP Northwest Pacific Action Plan (UNEP-NOWPAP), the joint development with the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) of the capacity building proposal on the Integrated Marine Biogeochemistry and Ecosystem Research for the Asia and Pacific; the joint organization with the FAO/GEF Bay of Bengal Large Marine Ecosystem Project (BOBLME) of the second MOMSEI Summer School, the provision of assistance in the development of the procedures and guidelines for IOC-WMO Regional Marine Instrument Centers (RMICs) and in the organization of the JCOMM marine instrumentation Workshop for the Asia and Pacific; and the co-sponsoring and co-organization, on behalf of IOC, of the Eastern and South-Eastern Asian Seas Workshop of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-Economic Aspects (Regular Process).

27 Mr Zhu then provided an overview of the Sub-Commission’s budget (Document IOC/SC-WESTPAC-IX/7). Given the limited funding provided by IOC, most activities were implemented

through extrabudgetary support, both in-cash and in-kind from Member States. It can be seen that WESTPAC achievements do yield positive results with the extrabudgetary support increased over the last four years. He highlighted the joint responsibility between Member States and the WESTPAC Office in exploring any possible means to support WESTPAC in order to fulfill the requirements of the Sub-Commission in activity implementation.

28 Despite the substantial progress made over the intersessional period, Mr Zhu alerted the session of his concern over the shortage of human and financial resources in the WESTPAC Office against the ever-increasing demands from IOC and Member States in the region for the WESTPAC Office to deliver a wide and growing range of activities. He further encouraged each Member State to maintain close interactions with other national agencies, particularly UNESCO National Commission and funding agency to ensure their support to IOC could be clearly voiced at the governing bodies of UNESCO and possible funding could be allotted in support of marine scientific programmes; to coordinate the participation of their scientists and institutes nationwide into IOC and its WESTPAC programmes; to identify their suitable national experts who are capable and have willingness to promote regional cooperation, and help them develop their leadership in the international/regional programmes in the areas of disaster mitigation, climate change, ocean acidification and coastal erosion.

29 He also requested IOC to take better advantage of the strength of its regional subsidiary bodies to enhance the presence and competitiveness of IOC globally, regionally and nationally; and to provide more human resource support to the WESTPAC Office whenever possible.

30 **The Sub-Commission congratulated** the WESTPAC Officers and the WESTPAC Office on the substantial achievement made, particularly over recent years within the constraints of financial and human resources, and called on all Member States to continuously provide and elevate their contribution in support of WESTPAC activities, either in cash or in kind.

31 **The Sub-commission expressed** its appreciation to:

- The Government of Thailand for the provision of office space and facilities for the WESTPAC Office, and the secondment of additional full-time administrative assistants to the WESTPAC Office;
- The Government of Republic of Korea for hosting the 8th WESTPAC International Scientific Symposium in Busan, March 2011, and also for hosting the 9th Session;
- Member States, in particular, China, Japan, Indonesia, Malaysia, Thailand, Vietnam for their continued in-cash and in-kind contributions, such as secondments, provision of research vessels and facilities, and hosting of WESTPAC workshops and training courses.

32 **The Sub-Commission endorsed** the Chairperson's statement and the Technical Secretary's report on WESTPAC's intersessional activities and budget overview.

3.1.3 Operation of the IOC Regional Office for WESTPAC

33 Mr Zhu provided some background information on the operation of the WESTPAC Office. Since its establishment in November 1994, WESTPAC Office has been hosted by the Royal Thai Government. He expressed appreciation for the in-cash and administrative support provided by Thailand for the smooth operation of the Office.

34 The sole IOC Regular Staff in the WESTPAC Office remains the same as before with Mr Wenxi Zhu appointed as Head of the Office in 19 December 2008. Ms Nachapa Saransuth has been working as the Administrative and Programme Assistant since November 2002 through the Service Contract with UNESCO with funding allotted from IOC for WESTPAC activities. In addition, there are three junior administrative staff seconded by the host government.

35 Through the kind support of the East China Normal University, Dr Junhong Li was loaned to the WESTPAC Office for three months last year to assist in the preparations of the Eighth WESTPAC International Scientific Symposium. Following the offer of the Government of China made at the last session, another scientist is expected to be seconded to the WESTPAC Office from the middle of 2012 to assist in the implementation of WESTPAC activities.

36 Mr Zhu emphasized that the seconded staff provided valuable assistance in implementing WESTPAC's activities. He then expressed his concern over the long-term increasing work load and programme expansion, and reiterated that secondment of technical staff and/or associate experts by Member States continues to be highly encouraged.

37 The lack of human resources within the WESTPAC Office generated strong concern from Member States. One clarification was made on the ideal staffing situation of the WESTPAC Office. According to the Agreement signed in 1994 between UNESCO and the Government of Thailand concerning the establishment of the WESTPAC Office, the WESTPAC Office should be staffed with four professionals and 5-6 local support staff. The acting Chairperson encouraged all project leaders and team members to visit the WESTPAC Office to develop project ideas, discuss progress and the way forward, while Dr Watson-Wright asked the Member States to continue their support to the WESTPAC Office through in-kind, in-cash, and secondments.

38 While appreciating the remarkable efforts made and the pivotal role the WESTPAC Office has been playing in the development of WESTPAC, **the Sub-Commission noted with concern** the understaffed situation in the WESTPAC Office and its requirement on the types of expertise, and **further encouraged** Member States to explore the possibilities, to the greatest extent, of loaning their experts to the WESTPAC Office.

3.2 RECENT DEVELOPMENTS WITHIN IOC/UNESCO, AND ITS RELEVANCE TO WESTPAC

39 Dr Watson-Wright was invited to brief the session on the key programmes of IOC and also the current financial situation of UNESCO and IOC that might impact the programmes. First, she gave a brief overview of the various programmes dealing with ocean observation, monitoring, and data collection. Following the General Conference vote admitting Palestine as a Member State of UNESCO, the United States of America and Israel have withheld their assessed contributions (22.38% of UNESCO totals), resulting in a Regular Programme budget deficit of US\$ 7.3 million. This has also affected IOC staff positions funded by USA with some staff being transferred out of IOC. There is also a risk that programmes will be affected and IOC may lose its recognized leadership in ocean sciences, observations, data management, and services. At the regional level, this will negatively impact on WESTPAC for 2012–2013.

40 Dr Watson-Wright provided additional information on the Rio+20 Conference, including the background and structure. She informed the Session that IOC will play an advocating role for oceans at RIO+20, working with other UN agencies. IOC has prepared an interagency report, a blueprint for ocean and coastal sustainability. The blueprint was launched at the 36th Conference General of UNESCO, submitted to the United Nations Commission on Sustainable Development (UNCSD), and promoted at various international conferences.

41 Rio+20 aims to raise awareness worldwide on the importance of oceans, and IOC will showcase ocean areas where UNESCO plays a role, e.g. through the Man and Biosphere and International Hydrological Programmes, climate change impacts, hypoxia, ocean acidification, and ocean warming. Other initiatives to be brought to the conference include: (i) the Ocean Compact to protect people and health of oceans, protect the recovery and sustainable ocean health and services; (ii) Science Initiative to strengthen ocean knowledge and management of oceans through science-based knowledge. Proposals have been prepared for the advisory committee to finalize. Unfortunately no Member States have been involved in this process;

however, should Member States have any issues they wish the Conference to address, they may submit these via their UNESCO National Commission to the country delegation based in New York. Dr Watson-Wright also alerted the Session about the Rio+20 Dialogues that the countries may join to make their voices heard. (iii) The Convention on Biological Diversity (CBD)'s Subsidiary Body on Scientific, Technical and Technological Advice is preparing a review of ocean acidification impacts on biodiversity and ocean ecosystem functioning.

42 **The Sub-commission took note** with concern of the financial challenges and **encouraged** Member States to consider exploring other ways to support IOC programmes either in-cash or in-kind. **The Sub-Commission expressed** their appreciation for the IOC' efforts in bringing ocean issues to the Rio+20, and **encouraged** all Member States to take an active part in these events.

4. **POLICY ISSUES**

4.1 PERSPECTIVES OF IOC ON THE FUTURE DEVELOPMENT OF SUB-COMMISSION

43 Dr Watson-Wright was invited to offer suggestions on the future development of the Sub-Commission. She reiterated that WESTPAC has been a very strong programme and could provide other Sub-Commissions with lessons learned and best practices. Other aspects for WESTPAC to consider in the near future include: sharing experiences on how to get Member State's strong support and how to go forward; involvement of small island States, and interacting with other organizations, particularly those located in the Pacific, such as the Secretariat of the Pacific Regional Environment Programme (SPREP); development of some metrics to monitor the results and impacts of the programme; and improving communication between IOC global programmes and WESTPAC programmes, perhaps through the positioning of regional liaison officers in IOC headquarters.

44 Following on from the concerns in the previous agenda, it was suggested that strategies need to be developed to attract support for IOC and WESTPAC. Member States and the Secretariat could consider tapping the private sector and foundations for funds. Another option would be to utilize the technical capacity in the region and establish institutes that focus on selected topics.

45 **The Sub-commission thanked** the Executive Secretary of IOC for her insight into the importance of WESTPAC and its contribution to the whole IOC, and **decided** to continuously look for ways to improve the operation and enhance the visibility of WESTPAC.

4.2 WESTPAC OCEAN RESEARCH PRIORITY PLAN

46 Dr Fukuyo, Chair of the WESTPAC Advisory Group, presented the progress of the preparation of the WESTPAC Regional Ocean Research Priority Plan (RORP) and identified the challenges faced during the last intersessional period. This activity was initiated by WESTPAC Officers at its first meeting on 28–29 October 2008, aiming to identify the most compelling regional issues in the key areas of interaction between society and the ocean, present possible research priorities together with pilot projects, and provide a framework for research investments in ocean sciences for the future. Once finalized, the plan could serve as a blueprint for WESTPAC to mobilize the efforts of its Member States to address the identified issues.

47 Dr Fukuyo informed the Session that no meetings had been convened over last intersessional period due to the difficulties in the identification of suitable experts with cross-disciplinary scientific background. Despite this, the Advisory Group recommends to establish four thematic drafting groups as early as possible to work on four identified regional societal themes (subject to further modification if needed): (i) Role of ocean in climate change and variability; (ii) Resilience and vulnerability; (iii) Health of ocean ecosystem; and (iv) Sustainability of marine and coastal resources, and energies. The Plan will serve as one long-term strategy

for WESTPAC to concert joint efforts of Member States to provide scientific inputs towards the sustainable development.

48 The presentation generated wide discussions with regard to the significance, identified societal themes and draft methodology. Salient points for WESTPAC to consider include: Incorporation into the development of RORP of the concept of sustainability science which addresses the relationships among environment, economic and social issues; establishment of a pool of experts to draw upon when the relevant expertise is required; and the provision of an online forum accessible to Member States to track the development of the Plan.

49 Following the above suggestions, **The Sub-Commission decided** to form four thematic drafting groups, and **requested** all IOC National Coordinating Bodies to assist in the identification of the most suitable experts in their countries, and facilitate their participation in this regional effort.

4.3 THE EIGHTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM IN 2011, REPUBLIC OF KOREA, WITH FOCUS ON LESSON LEARNT

50 Dr Dosoo Jang, Chair of the Local Organizing Committee of the Eighth WESTPAC International Scientific Symposium, presented the outcomes and lessons learned from the event that was organized on 28–31 March 2011, Busan. The objective of the Symposium, entitled “Ocean Climate and Marine Ecosystems in the Western Pacific”, was to provide an interdisciplinary platform for marine scientists, managers from the region to assess and prioritize emerging issues requiring scientific research, and catalyze international and cross-disciplinary collaboration towards the improvement in management practices and decision-making processes for the sustainable development of ocean and coastal resources.

51 More than 500 enthusiastic marine scientists, policy makers and public figures participated in the event. The symposium featured 11 concurrent sessions and eight workshops, identified knowledge gaps and shared information on the latest development in marine scientific research, ocean observation, and numerical models in order to address such ocean-related hotspot issues as the ocean’s regulating role in climate change, ocean acidification, coral bleaching, marine invasive species, sea level rise, coastal erosion, harmful algae bloom. Moreover, Young Scientist Travel Fund was initiated in support of the travel expenditure of these selected young scientists, and WESTPAC Best Young Scientist Award was established for the first time with 4 young scientists selected for their exemplary oral or poster presentations.

52 Dr Jang identified some lessons learned to facilitate the organization of the next symposium, which included that: session chairs should be identified early and seek their confirmation; organizers will have to put in extra work to follow up with participants to confirm their attendance and any change in schedules; printed symposium proceedings are a good media to show the presentations that will be given; and travel funds should be sought for more young scientists to attend the event and WESTPAC Best Young Scientist Award shall continue as customary.

53 **The Sub-commission congratulated** Dr Jang and the National Organizing Committee, the International Scientific Steering Committee and WESTPAC Office on the successful organization of the Eighth WESTPAC International Scientific Symposium, Busan 2011; and **expressed** its sincere appreciation to the Government of Korea for hosting and tremendous support provided for this symposium.

4.4 THE PREPARATIONS FOR THE NINTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM, VIETNAM 2014

54 Dr Bui Hong Long, Institute of Oceanography, Vietnam, informed the meeting of the preparatory efforts made thus far for the Ninth WESTPAC International Scientific Symposium

2014, Nha Trang, Vietnam, 9–12 April 2014. Numerous national meetings have been held in Vietnam among relevant institutes, academies and ministries with Official approval for hosting the event obtained recently.

55 The main theme was proposed as: Ocean and Coastal Biodiversity Resources in the Western Pacific and sustainable development in a changing world, with 7 sub-themes including impacts of climate change and human dimensions. A tentative agenda was presented which will be further modified based on the final topics to be included in the symposium.

56 The meeting suggested that the Symposium be listed as one of commemorative events for the Twenty-fifth WESTPAC Anniversary with special key note speeches and exhibitions arranged, and an award presented to young and other outstanding scientists. It was also suggested that the scope of the proposed themes be expanded to accommodate other marine disciplines.

57 The Sessional Working Group on the Ninth WESTPAC International Scientific Symposium was formed to consider the suggestions provided from the Session, and further develop the conference structure.

58 **The Sub-Commission** thanked the Government of Vietnam for the kind offer to host the Ninth WESTPAC International Scientific Symposium in 2014, and the preparations made thus far. The **Sub-Commission further suggested** the International Scientific Steering Committee be established with the composition of lead scientists recommended from Member States, develop and finalize, with reference to the recommendation of the Sessional Working Group, the theme, sub-themes and programme as early as possible.

59 **The Sub-Commission reviewed and adopted** [Recommendation SC-WESTPAC-IX.1](#) pertaining to the Ninth WESTPAC International Scientific Symposium.

4.5 CELEBRATING THE TWENTY-FIFTH ANNIVERSARY OF WESTPAC

60 Professor Dr Nor Aieni Binti Hj Mokhtar, as chairperson of the Sessional Working Group on the 25th Anniversary of WESTPAC, reported the discussions to the plenary by stressing the need for WESTPAC to take this opportunity to maintain the current momentum and enhance the awareness of various stakeholders on the importance of marine science and observations, and the value of the Sub-Commission.

61 She further suggested a series of commemorative activities in 2013–2014, including the development of the logo and other commemorative items for the WESTPAC's 25th Anniversary; the inclusion of the logo into all WESTPAC-related meetings, cruises, symposium, trainings, publications, reports, brochures and outreach materials. It was also suggested that Member States develop their own ideas to showcase WESTPAC relevant activities at domestic level. The Sessional Working Group considered the Ninth WESTPAC International Scientific Symposium, Vietnam 2014 as one of the optimal events celebrating the 25th Anniversary, and proposed several special commemorative activities be arranged throughout the Symposium. These include one keynote speech on the history and achievement of WESTPAC; a special exhibition with posters presented from countries on their involvement in and benefit from WESTPAC; and the continuation of the WESTPAC Young Scientist Award etc.

62 **The Sub-Commission recognized** the significance of celebrating the 25th Anniversary of WESTPAC to enhance the level of public awareness on the importance of collaboration and involvement in ocean science, take stock of advances and chart the future in marine science at the regional and national level, thus demonstrating the value of the Sub-Commission's achievements in promoting marine sciences.

63 **The Sub-Commission decided** to start the preparation, with reference to the suggested actions from the Sessional Working Group, of a series of commemorative activities to be conducted in late 2013 and 2014.

64 **The Sub-Commission adopted** [Recommendation SC-WESTPAC-IX.2](#) regarding the Twenty-fifth Anniversary of the IOC Sub-Commission for the Western Pacific.

5. REVIEW AND EVALUATION OF REGIONAL PROGRAMMES, PROJECTS AND WORKING GROUPS FOR MAY 2010–MAY 2012

65 Dr Fukuyo provided a brief overview of WESTPAC programmes, projects and working groups, and called on each programme/project leader and working group chairperson to provide an in-depth assessment of their progress.

5.1 MARINE SCIENCE AND APPLICATIONS

5.1.1 Harmful Algal Blooms

66 Dr Mitsunori Iwataki, Yamagata University, Japan, presented the project objectives and achievements. Two strategic planning workshops (29 March 2011; 15–17 March 2012) and two capacity building workshops (20–24 March 2011; 19–22 March 2012) were held. The workshops allowed for information exchange on HABs in the region. There is an increasing number of HAB researchers in the region, and the workshops helped to promote collaboration among WESTPAC-HAB group and expand research on HAB. The training courses will continue over the next two years at regional and local levels. Outreach materials will be produced, aiming to educate children about HABs. Additional support is requested from the current donors - Japan Funds in Trust, Asian Natural Environmental Science Centre, University of Tokyo.

5.1.2 Ocean Remote Sensing

67 Dr Teruhisa Komatsu from the University of Tokyo, Japan, informed the meeting of the progress of the Ocean Remote Sensing for Coastal Habitat Mapping which was approved at the last session (WESTPAC-VIII, Bali, Indonesia, 10–13 May 2010). He showed the different coastal biome coverage throughout the world, the services they provide, and the threats to coastal ecosystems. Therefore, it is necessary to map coastal habitats in order to monitor the health of these important ecosystems for policy making and set marine protected areas to meet the Aichi Biodiversity targets under the Convention on Biological Diversity.

68 A kick-off meeting was convened in Busan in March 2011 to review the current status of habitat mapping in the region. The meeting decided that the project would focus on seagrass bed mapping using ALOS AVNIR2 images of Japanese Satellite. A second workshop was organized at the Universiti Teknologi Malaysia in November 2011. After reviewing the existing seagrass bed maps including databases and temporal changes in seagrass distribution and human impacts, relation between seagrass beds and fish resources, and methods of image analysis and ground-truthing. The project agreed on the standardized methods to use for image analysis and ground truthing. Additional efforts have been made to promote the project at relevant occasions, including the presentation at the biennial conference of Indonesian Society of Remote Sensing in Bogor in August 2010 and the joint organization of the NOWPAP/PICES/WESTPAC Training Course on Remote Sensing Data Analysis held in Vladivostok in October 2011.

5.1.3 Response of Marine Hazards to Climate Change

69 Dr Fangli Qiao, First Institute of Oceanography, State Oceanic Administration (SOA), China, briefed the meeting on this project with emphasis on the importance of the platform the project established to bring together scientists to share and advance their scientific knowledge,

by means of field observation, model development, capacity building and process study on the variability of marine hazards in relation to climate change. He reported three cruises were conducted in the typhoon generation area-South China Sea, and three workshops were convened to review the implementation and plan its future activities. The most recent cruise carried out from October to November 2011 were participated by scientists from Thailand, Malaysia and China. Project progress also includes the development of one operational regional ocean forecast systems that is continuing, and plans for a joint cruise in the Western Pacific and a workshop later this year.

5.1.4 South China Sea Fluvial Sediments and Environment Changes

70 Dr Shouting Tuo, presenting on behalf of Professor Zhifei Liu, Tongji University, China, highlighted the achievements from the last four years since project inception. The project investigates fluvial sediments surrounding the South China Sea, in order to further understand how human activities affect the sediment discharge recently and finally to predict future changes. He briefed the Session on a variety of activities conducted during May 2010 to May 2012 in the form of international workshops, fieldwork and research cooperation, bilateral scientific visits, and young scientist and graduate student training. Two regular international workshops on the Fluvial Sediment Supply to the South China Sea were successfully held in Quezon City (Philippines), 17–18 November 2010 and Bangkok (Thailand), 14–16 December 2011. Six fieldwork sessions were carried out in Thailand, Philippines, and China to collect sediments from major rivers for the measurement of clay mineralogy and elemental geochemistry. Six bilateral visits and related collaborations were conducted, and seven young scientists from Vietnam, Thailand, Malaysia, Philippines, and DPR Korea visited Tongji University for graduate research or short-term laboratory analysis training. Additionally, some results were already published or are under review by international journals such as *Marine Geology*, *Chemical Geology*, and *Journal of Asian Earth Sciences*. Dr Tuo also highlighted the spirit of close cooperation reflected from all participating members and suggested that the project be continued with the research focusing on fluvial sediment's source-to-sink process along the continental shelf and in the deep basin of the South China Sea.

71 Responding to one inquiry on the sharing of data collected from WESTPAC projects, clarification was made that, following common practice, data has been shared among participating members. As regards when these data could be available to the public, the meeting suggested that the appropriate arrangements be further explored with full consideration of intellectual property rights. One suggestion was made that ODINWESTPAC may provide a suitable platform to discuss these issues.

5.1.5 Marine and Coastal Biodiversity and its Management

72 Dr Suchana Chavanich, Chulalongkorn University, Thailand, reported that the project had been working on marine invasive species amongst other biodiversity conservation related issues over the last four years. A series of activities implemented over the last two years include: the convening of four training workshops, in collaboration with PICES and other regional partners on the Rapid Assessment Survey Techniques for the Detection of Marine Non-indigenous Species, 20–21 September 2010 and 6–9 December 2010 in Bangkok, Thailand; 19–21 July 2011 in Phuket, Thailand, and 8–9 February 2012 in Nagasaki, Japan; the publication and dissemination of the regional status of marine non-indigenous species to provide baseline information; one poster available in English and Thai languages for enhancing public awareness; disseminating results of the project at various international scientific events.

73 Considering the 2010 coral bleaching event in the region, Dr Chavanich proposed a workshop later this year to focus on coral reef restoration techniques with objectives to summarize all coral restoration methods available within and outside the Western Pacific and promote the best practices for coral restoration.

5.1.6 Coral Reef under Climate and Anthropogenic Perturbations

74 Dr Xuelei Zhang, First Institute of Oceanography (SOA), China, briefed the Session on behalf of Professor Jing Zhang on the key activities conducted over the last two years. The project aims to improve the understanding of biogeochemical and ecological nature of coral reefs in WESTPAC region under different geographic, physical and environmental settings through the organization of a series of workshops and training activities, which includes the conduct of the 2nd and 3rd regional workshops on the Coral Reef under Climate and Anthropogenic Perturbations, respectively in Phuket, Thailand, 22–24 June 2010 and in Busan, Korea, 29–31 March 2011. In addition to exchanging information on coral reef research, two training courses were organized with emphasis on the “Impact of Sedimentary Dynamics and Biogeochemistry on Coral Reefs” at Koh Samui, Thailand, 15–18 June 2010, and “Water Quality and Impact on Coral Reefs”, in Sanya, China on 8–11 June 2011.

75 He touched upon the future activities to be conducted, which included continuous preparation of manuscripts for peer-reviewed journals; collaboration with SCOR/IGBP-IMBER in the conduct of one capacity building workshop on integrated marine biogeochemistry ecosystem research in Asia-Pacific region; and the organization of the fourth regional workshop to plan the future of the project focusing on synthesizing existing knowledge on coral reef studies within the scope of the project.

76 Broad interests have been aroused from Member States in terms of the importance that most of countries in the region accord to their coral reefs. **The Sub-Commission suggested** that the partnership be established with other regional coral reef initiatives, particularly the Coral Triangle initiative (CTI), with a view to enhancing the visibility of the project in the region and transmitting scientific knowledge to wider communities.

5.1.7 Toxic Marine Organisms

77 Dr Dao Viet Ha, Institute of Oceanography, Vietnam, reported to the meeting that concrete actions have been undertaken since the project’s establishment at the WESTPAC-VIII, to achieve the objectives of improving the awareness of local communities on the natural biotoxins found in marine organisms and its risks to human health through the identification of toxic marine organisms and dissemination of relevant scientific information to the public. Two regional workshops have been organized on 13–15 December 2010 and 4–6 November 2011, Nha Trang, Vietnam with a regional network established and public awareness materials produced. Following the identified capacity building needs, two regional training courses were developed and conducted in collaboration with WESTPAC-Harmful Algae Bloom project on “Taxonomy and Ecology of the diatom, *Pseudo-nitzschia*”, 20–23 March 2011, Sarawak, Malaysia, and on “Immunological method for detection of domoic acid in plankton and shellfish”, 19–22 March 2012, Nha Trang, Vietnam.

78 Future activities were also briefed, including: the 3rd workshop to be held in conjunction with the 15th International Conference on Harmful Algae, 29 Oct–2 Nov 2012, Changwon, Republic of Korea; the 4th workshop to be held in collaboration with the National University of Singapore to finalize the project webpage; finalization and printing of more public awareness materials.

79 In response to her concern over the shortage of financial resources, it was suggested that she may apply for funding from the Korea International Cooperation Agency (KOICA). One clarification was sought with regard to the composition of the project steering group. Dr Dao explained that all members were identified in a time efficient manner either through the nominations from IOC National Focal Points or through the scientific network of the project leader in case of no nomination received from IOC National Focal Points. Furthermore, **the Sub-Commission encouraged** all national focal points to assist the WESTPAC Office, and project leader in the identification of suitable experts to be actively involved in the project.

5.1.8 DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms

80 The acting Chairperson informed the Session that, despite great efforts made, the project failed to obtain funding to implement its planned activities. However, in view of the strong interests expressed from scientists in the region and the need for this project to investigate the extent of marine biodiversity and its dynamics with a genetic tool called DNA barcoding, the Advisory Group and project leader further requested the Sub-Commission to consider suspending this project until funding is sought.

81 Constructive suggestions were made on the continuation of this project. For instance, communication could be established first, despite the lack of funding at this moment, among the interested scientists to advance information exchange. **The Sub-Commission took note** of the situation, **decided** to suspend the project, and further encourage the project leader and WESTPAC Office to continuously seek funding sources during the next intersessional period.

5.2 OCEAN OBSERVATIONS AND SERVICES

5.2.1 North East Asian Regional-GOOS

82 Dr Heedong Jeong, Chair of the WESTPAC Coordinating Committee for the North East Asian Regional-GOOS (NEAR-GOOS), presented the implementation of NEAR-GOOS over the past two years and the efforts made by each of the participating countries in terms of the amount and types of data transmitted in both real-time and delayed modes, data network development, data products produced, the related services provided, and the amount of users that have benefitted from the services provided by the NEAR-GOOS. National observing systems and operational oceanographic systems have been developed in four participating countries and will continue its contribution to the NEAR-GOOS. One pilot project "NEAR-GOOS Cross-basin Climate Monitoring Section" has conducted the first synchronized observation on 3–6 November 2011.

83 Dr Jeong briefed the meeting of the outcomes from the recent Fourteenth Session of the Coordinating Committee in achieving the objectives for the second Phase of NEAR-GOOS: developing a comprehensive and sustained ocean observing network and an operational forecasting system in the region; continuing the management of the data exchange mechanisms developed in the first phase by increasing data parameters and the space of coverage, and timely generating more data products in order to improve the services and demonstrate the value of NEAR-GOOS in the region. He also mentioned the establishment of the Yellow Sea and East China Sea Operational Observing System, and presented the future activities covering: the efficiency and visibility of NEAR-GOOS; possible inclusion of non-physical data; cooperation on data product development; establishment of the NEAR-GOOS working group on product while retaining the working group on data management; and cooperation with other regional projects such as SEAGOOS, PICES, NOWPAP remote sensing training course, ODINWESTPAC.

5.2.2 South East Asian Regional-GOOS, including Monsoon Onset Monitoring and its Social and Ecosystem Impacts, Ocean Forecasting Demonstration System

84 Dr Somkiat Khokiattiwong, Coordinator for the South East Asian Regional-GOOS (SEAGOOS), Phuket Marine Biological Center, presented the background and implementation progress of SEAGOOS with emphasis on the development of two pilot projects, "Monsoon Onset Monitoring over Andaman Sea and its Social & Ecosystem Impacts" (MOMSEI) and "Ocean Forecast Demonstration System" (OFDS) to demonstrate the value of observation for ecosystem and societal benefit. Following the three expert workshops conducted in 2009, MOMSEI carried out a series of concrete actions in 2010 and 2011, including three multi-disciplinary joint cruises conducted on 20–23 October 2011, 11–17 March 2011, and 20 April–12 May 2012, covering the vast area from Andaman Sea to tropical Indian Ocean, capturing

the monsoon onset process in tropical eastern Indian; two MOMSEI Summer Schools were held on 25–30 July 2010 and 15–18 August 2011 to build the capacity of young scientists on monsoon dynamics, coral biology and ecosystem, and ocean observations. A new partnership was formed with the FAO/GEF Bay of Bengal Large Marine Ecosystem Project through the joint organization of the 2nd MOMSEI Summer School.

85 Dr Fredolin Tangang, Universiti Kebangsaan Malaysia, was then invited to report on the progress of the pilot project “Ocean Forecast Demonstration System” (OFDS). This pilot project was initially developed based on existing cooperation among Malaysia, Thailand and China, but could be expanded to accommodate more countries in the future. This project aims to demonstrate the value of ocean forecasting system initially on Peninsular Malaysia’s eastern shelf and Gulf of Thailand through the development of wave-tide-circulation coupled numerical model for the two sub-regions. Key activities conducted include two technical workshops organized in October 2010, Phuket, Thailand and May 2011, Qingdao, China with objectives to share the knowledge on the development of ocean forecasting systems in the region, and identify cooperative opportunities for model validation and cruises towards the development of one ocean forecast system in the selected demonstration areas. Two cruises were conducted in the South China Sea and Gulf of Thailand (Thai and Malaysian waters) from July-September 2011. Meanwhile, recognizing the importance of capacity building in the development of ocean forecast system, one training course on Ocean Models was provided at the IOC Regional Training and Research Center on Ocean Dynamics and Climate (ODC Center), Qingdao, China on 10–16 June 2011, to assist a group of scientists in the project further study and exchange the outcomes of their study. The project’s product, Ocean Forecast Demonstration System in the Southeast Asian Seas of WESTPAC, is accessible through the project’s website.

86 Dr Tangang highlighted the contribution of this project to the society in that there does not exist any real-time forecasting in the southern part of the South China Sea, and these crucial forecast information, such as ocean circulation, sea surface temperature, wave height, generated from the demonstration system could serve the needs of a variety of human activities related to marine hazards mitigation, oil and gas exploration, fisheries, navigation, marine parks management and coastal recreational activities. The project aims to publish more papers and produce more real-time forecast online.

87 A ceremony was held subsequently to launch the “Ocean Forecasting Demonstration System in the Southeast Asian Seas of WESTPAC” which was developed by the SEAGOOS pilot project on OFDS. As the only publicly accessible marine forecasting system available in the region, the website provides marine forecasts for up to three days ahead, e.g. current, temperature, wave height, circulation, by depth and time. While congratulating the project leader and members on their teamwork to make this website and collaboration possible, and the WESTPAC Office on its leadership and coordination role to realize this project, she highlighted the benefits the project generated, and expected the efforts shall be continuously made, not just to improve the system, but also attract more countries’ involvement in the future.

88 The recent developments of SEAGOOS aroused wide interests from the meeting in terms of its linkage with societal and ecosystem benefits. **The Sub-Commission noted** with appreciation the substantial progress, and further **suggested** involving more countries in the region to maximize the benefit. **The Sub-Commission thanked** the Government of Myanmar for the kind offer, subject to the final approval of relevant authorities, to host the sixth MOMSEI expert workshop in late 2012, and **urged** the WESTPAC Office to start the organization of the workshop as early as possible, in order to meet the approval procedures of the Government of Myanmar.

5.2.3 Marine Hazards Forecasting and Mitigation in the Western Pacific

89 Dr Fujiang Yu, Deputy Director General, National Marine Environment Forecasting Center (NMEFC), China, presented the project achievements by briefing the Session on project

objectives and the efforts made for their realization. The project aims to: (i) develop new technology of marine hazards forecast, especially coastal numerical inundation forecast model; (ii) improve the capability of WESTPAC Member States for marine hazards warning and mitigation; (iii) exchange and share the experience of marine hazards forecast, and enhance the cooperation of WESTPAC Member States on marine hazards warning and mitigation technology. He also recalled the recent cooperation of his institute with the Korea Ocean Research and Development Institute in the development of a marine environment forecasting system in the Yellow Sea, and informed the meeting that one regional training workshop on tsunami model development will be organized in October 2012; and one workshop on ocean wave and storm surge forecasting workshop is being planned for 2013.

90 **The Sub-Commission** noted the regional training on tsunami model development will be jointly organized under the auspices of WESTPAC and ICG/PTWS with detailed programme under further refinement. In view of the increasing need for improving the regional capability for marine hazard forecast and mitigation, **the Sub-Commission expressed** its concern over the late submission of the progress report and delay in the implementation of planned activities, and **further emphasized** the timeline for report submission be respected, and proposed activities be carried out as planned in order to achieve the expected objectives.

5.2.4 International Bathymetric Chart of the Western Pacific

91 Dr Sihai Li, National Marine Data and Information Service, China, spoke on behalf of Professor Hou Wenfeng, Chief Editor for the IBCWP Editorial Board. Dr Li presented the progress made in the IBCWP programme involving China, Japan, Philippines, Republic of Korea, Russian Federation, and Vietnam. The project has thus far compiled most of the data map sheets for three sub-regions out of the six which the project intends to cover. Dr Li expressed concern that the Fifth Session of IBCWP has not yet taken place after its fourth session in 2004 despite some progress still under way in the participating countries. While stressing the need for a regional platform to improve the bathymetric mapping technology, he suggested replacing the IBCWP project with one working group mandated to exchange technical experience on the compilation of bathymetric charts, and promote the application of marine geospatial technologies in risk assessment. To this end, Dr Li expressed the offer of his institute to host the first technical meeting of the working group.

92 Some Member States expressed interests to join the project implementation, and requested future information be shared with its relevant national agencies. Concerns were voiced over the lack of progress due to the retirement of the Chief Editor. **The Sub-Commission took note of** the difficulties in the project implementation, **stressed** the need for a regional platform among interested Member States to exchange their bathymetric mapping techniques, and **further suggested** an appropriate mechanism be sought to continuously promote the regional cooperation in this field.

5.2.5 Ocean Data & Information Network for the Western Pacific

93 Dr Jixiang Chen, reported on the project progress, on behalf of Dr Shaohua Lin, Regional Coordinator for ODINWESTPAC. Dr Chen informed the Session on the establishment of a Project Coordinating Group, identification of focal points for data and information management, cooperation with NEAR-GOOS, SEAGOOS, and IODE/ODP, acquisition of hardware and software for constructing and operating a marine information website at NMDIS, and development of a preliminary structure of the website. Future activities include the continuous collection of data and information, the organization of a training course to assist countries in the implementation of ODINWESTPAC Project, the development of ODINWESTPAC Visualization system for integrating, managing and displaying all of the marine data and information that exchanged among WESTPAC Member States, and from other regional and international programs/projects; the collection of cruise summary reports in the

region from IODE histories ROSCOP report and Member States, and the updating and enrichment of the directory of marine libraries and ocean publications

94 **The Sub-Commission urged** the project to accelerate its implementation as it is an important regional activity to provide data services to the region. The project was also asked to enhance communication between ODINWESTPAC and ODIN in other regions, particularly in Africa in order to exchange experiences and lessons learned. **The Sub-Commission further encouraged** Member States to assist in the identification of their suitable national experts and to facilitate their active participation in the project implementation.

5.3 CAPACITY BUILDING AND PUBLIC AWARENESS

5.3.1 UNESCO/IOC Regional Network of Training and Research Centres on Marine Science in the Western Pacific

95 Mr Zhu briefed the session on the implementation of the self-driven, regionally-specific capacity building initiative, “UNESCO/IOC Regional Network of Training and Research Centres on Marine Science in the Western Pacific” by referring to the establishment of one Regional Training and Research Centre on Ocean Dynamics and Climate. He further informed the meeting the regional training and research center on Ocean Dynamics and Climate has been put into operation immediately following the inauguration ceremony on 9 June 2011 with the first regional training course on ocean models conducted on 10–16 June 2011. Meanwhile, effort has been made with other countries, institutes, universities interested to explore the potential for the establishment of regional training and research centers within their domains of focus. Positive responses have been received from several countries in the region.

96 Extensive support was voiced to the implementation of this initiative with strong willingness expressed from Indonesia to establish a regional training and research center on tropical marine biodiversity in support of CTI, from Thailand to establish one regional training and research center on marine ecological conservation and climate change; and from Malaysia to host one regional training and research center by building upon its universities’ Centers of Excellence. Meanwhile, Republic of Korea has been positively exploring the possibility of the establishment of one regional training and research center, and Japan has also been considering appropriate ways to contribute to the Network.

97 The delegation of China offered to share experiences and provide any necessary assistance in the establishment and operation of future centres. Discussions are under way to establish a fund to provide scholarships for students from the region wishing to major in marine science.

98 **The Sub-Commission highly appreciated** the WESTPAC Office for the efforts made in the establishment and implementation of this regional capacity building initiative, **invited** Member States to engage their national oceanographic institutes and universities in the Regional Network; and **further requested** the Executive Secretary of IOC to take necessary actions to promote this regional capacity building activity.

99 **The Sub-Commission accepted** [Recommendation SC-WESTPAC-IX.3](#) on the UNESCO/IOC Regional Network of Training and Research Centres on Marine Science.

5.3.2 IOC Regional Training and Research Center on Ocean Dynamics and Climate

100 Dr Fangli Qiao, Director of the IOC Regional Training and Research Centre on Ocean Dynamics and Climate, presented the major activities of the Center since its establishment through the Agreement signed by IOC and the host institute, the First Institute of Oceanography, State Oceanic Administration, China, at the last Session on 11 May 2010. He informed the meeting that immediately after the inauguration ceremony of the Center on 9 June

2011, the first regional training course on ocean models was subsequently organized in the ODC centre during 10–16 June 2011 with tremendous interests received from and outside the region to join the training. Ultimately, 10 world leading scientists on ocean numerical modeling and 69 trainees were selected from 10 countries with 20 students' travel funded by the Centre. He further informed the meeting that according to its five year plan, the second training course on ocean dynamics is being planned and scheduled for 16–22 July 2012. Website and email lists have been developed to share the teaching materials and facilitate the post-training scientific discussions.

101 Information was provided on the operation of the Regional Training and Research Center, and financial implication for the regular trainings. Following the presentation, a Certificate of Appointment was presented by Dr Wendy Watson-Wright on behalf of the Commission to Dr Qiao in recognition of his appointment from 2011–2015 as the Centre Director.

102 **The Sub-Commission expressed** its high appreciation to Dr Fangli Qiao, his institute and the Government of China for their great contribution made to improve the regional capacity in the research of ocean dynamics, air-sea interaction, climate change, and numerical modeling, **and further encouraged** all Member States to nominate their qualified trainees to take part in the regular training courses.

5.3.3 IOC-WMO Regional Marine Instrument Center for the Asia and Pacific

103 Dr Jun Sui from the National Centre of Ocean Standards and Metrology, China, briefed on the IOC-WMO Regional Marine Instrument Centre for the Asia and Pacific (RMIC) which was established through IOC Resolution XXVI-9 and WMO Resolution 3.1.4/3 in July 2011 with a view to facilitating the adherence of observational data, metadata, and processed observational products to the higher level standards for instruments and methods of observation, by providing: (i) facilities for the calibration and maintenance of marine instruments and the monitoring of instrument performance; and (ii) assistance for instrument inter-comparisons, as well as appropriate training facilities complementing what the manufacturers provide. One training workshop on marine instrumentation for countries in the Asia-Pacific region was organized at the Centre, 11–13 July 2011 to help develop the capacity of the Asia-Pacific countries involved in ocean observations with a view to addressing the requirements of IOC and WMO applications.

104 Dr Sui expressed the willingness of the Centre to join the IOC Regional Network of Training and Research Centres on Marine Science, and further outlined the future activities to be conducted in the next two years, which include the establishment of a coordinating group to liaise with countries requiring instrument calibration and measurement services; the conduct of one survey to map the specific needs of Member States for instrument calibration; the provision of instrument calibration service on seawater conductivity/salinity, seawater temperature, seawater depth, tide, wave (wave height, wave period), and the provision of technical support in the development of marine observation standards and instrument calibration specifications. He finally informed that one CTD calibration workshop and one calibration workshop for float-type tide gauge and wave buoy will be organized respectively in October 2012, and in September 2013.

105 **The Sub-Commission welcomed** the IOC-WMO Regional Marine Instrument Centre for the Asia and Pacific to join the IOC Regional Network of Training and Research Centres on Marine Science, and **further encouraged** all Member States to actively participate in the activities of the RMIC, and communicate with the Centre their suggestions on and requirements for, if any, the marine instrument calibration and measurement services.

5.4 WESTPAC WORKING GROUPS

106 Dr Fukuyo introduced this agenda item, explaining that two WESTPAC Working Groups were formed in accordance with adopted Guideline for the Establishment of WESTPAC Working Groups, respectively on Asian Dust and its Impact on Ocean Ecosystem (ADOES) with a lifetime of four years, and on the UN Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-Economic aspects (Regular Process) with a lifetime of two years.

5.4.1 Working Group on Asian Dust and its Impact on Ocean Ecosystem

107 Speaking for Dr Huiwang Gao and Dr Mitsuo Uematsu, Co-Chairs of this Working Group, Dr Xiaopei Lin from Ocean University of China reported on the progress made while stressing the need to promote the study on Asian dust and its impact on ocean ecosystem in the Western Pacific. Key activities of the working group include the organization of one workshop on Asian Dust and Ocean Ecosystem (ADOES) on 30 March 2011, Busan, Republic of Korea, and the co-organization of the 5th International Workshop on ADOES on 29 Nov.–2 Dec. 2010 in Nagasaki, Japan, the 6th Workshop on ADOES on 5–9 October 2011, Qingdao, China; and several cruises conducted in the Yellow and East China Seas and Western North Pacific with the scientific results published.

5.4.2 Working Group on Regular Process for Global Reporting and Assessment of the State of the Marine Environment

108 Dr Juying Wang, National Marine Environmental Monitoring Centre, China, presented the history, background and rationale of the Regular Process and informed the session on the activities that the Working Group has carried out. The Working Group has been involved in following up the progress, providing information to Member States and inputs to the global process. A regional workshop of the Regular Process for Eastern and Southeastern Asian Seas was convened in Sanya, China, in February 2012 under the auspices of the United Nations. The workshop brought together representatives from countries in the region as well as from international organizations that were updated on the progress of the Regular Process, and provided an opportunity to identify their capacity building needs for the first cycle of the integrated assessments in the Regular Process. A website (<http://regular.process.mem.gov.cn/eng>) has been established that contains information on the objectives, terms of reference, and activities carried out by the Working Group. The website also contains information and links to the global activities of the Regular Process. She further suggested the lifespan of the Working Group be extended from its originally proposed two years to at least four years in the light of the current progress of the Regular Process at the global level.

109 Clarification was sought in respect of the composition of the Working Group. Ms Wang explained that the Working Group members have not been finalized as it was difficult to identify suitable expertise before the Group of Experts, established by the UNGA for the Regular Process, could come up with clear scientific and technical guidelines for the conduct of the integrated marine assessment. However, considering some substantial progress has been made by the Group of Experts in 2011, it maybe timely in 2012 to officially finalize the members of the Working Group with assistance provided by Member States. One Working Group meeting will be convened to define a course of actions for WESTPAC in support of the Regular Process, and one training course will be organized to help build the capacity of Member States on the methodology of the integrated marine assessment.

110 With consideration of the fact that the progress of this Working Group largely depends on the progress of the Regular Process at global level, **the Sub-Commission decided** to extend the lifespan of this Working Group to four years, **further encouraged** the Working Group to follow closely the progress of the Regular Process, and conduct their activities at the appropriate time. Moreover, in view of the pressing need in the region for the integrated marine

assessment in the Regular Process, **the Sub-Commission encouraged** the Working Group to explore any possibilities to help Member States build their capacity.

5.5 REVIEW OF ON-GOING PROJECTS AND WORKING GROUPS BY THE WESTPAC ADVISORY GROUP

111 After reviewing the on-going projects and working groups, Dr Fukuyo, Chair of the Advisory Group, reported to the Session the outcome of the work undertaken by the group. The group recognized that as a whole, tremendous achievements were made over the last intersessional period, and tabled the following recommendations that:

- All the on-going projects and Working Groups be continued, and the WESTPAC Officers and WESTPAC Office, and project leaders' national focal points assist in any way possible for the implementation of these projects. However, following projects need to be alerted in terms of their implementation status and deliverables.
- "DNA taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms" be suspended until necessary funding is obtained;
- "Marine Hazards Forecasting and Mitigation in the Western Pacific" conduct its work as soon as possible, in particular, to establish its steering group and hold the regional training on tsunami models;
- "Ocean data & Information Network for the Western Pacific" (ODINWESTPAC) conduct its work as soon as possible in accordance with the workplan approved at the last session;
- "International Bathymetric Chart for the Western Pacific" (IBCWP), with consideration of the suggestion made on reforming this project as one WESTPAC Working Group with emphasis on the technical exchange on the marine cartography and the applications of bathymetric chart in marine and coastal area integrated management, establish the network, develop a complete working group proposal via correspondence and technical workshops, and submit the proposal to the next session for approval.

112 **The Sub-Commission recognized** the fact that challenges do arise for all projects and Working Groups, thus the evaluation process is a means to encourage all projects and Working Groups to implement their planned activities in a timely manner in order to attain the expected objectives.

113 **The Sub-Commission expressed** its appreciation to the Advisory Group and further **endorsed** the recommendations made by the Group.

6. REVIEW AND APPROVAL OF NEW PROJECT AND WORKING GROUP PROPOSALS

114 Dr Fukuyo briefed the meeting on the review process of the WESTPAC Advisory Group on one new project proposal and two new Working Groups proposals received in accordance with the framework established in the WESTPAC Strategy and Programme Structure and the Guideline for the Establishment of WESTPAC Working Groups. He further suggested that the Sub-Commission consider adopting the one project and two working groups after hearing the proposals. The proponents were invited to brief the Session on their proposals.

6.1 AIR-SEA INTERACTION IN THE KUROSHIO EXTENSION AND ITS CLIMATE IMPACT

115 Dr Xiaopei Lin introduced the proposal on "Air-sea Interaction in the Kuroshio Extension and its Climate Impact" with a lifetime of three years. The reasons for embarking on this project are the need to study global climate change, a need for more observations in this hotspot area, and a need for better models to simulate these phenomena in view of the crucial role of the

Kuroshio Extension region in the North Pacific climate system. The project objectives are to: (i) investigate feedback mechanisms between the sharp thermal front and storm track activity; (ii) develop models and observation networks; (iii) improve understanding of ocean and climate prediction in the region. Some expected outcomes include: high resolution regional coupled model system, published papers, and the establishment of a platform for scientific communication. Dr Lin showed some preliminary results and wished for collaboration between Japan and China to undertake these observations. A workplan containing a workshop, model development and information dissemination was shown.

116 Support was expressed for this project proposal in terms of the need for more observations and model development to study on the air-sea interaction in the Kuroshio Extension region, a key region for intense heat release, large CO² storage and complex variability.

6.2 MAPPING THE HARMFUL JELLYFISHES IN THE TROPICAL WESTERN PACIFIC

117 Dr Xuelei Zhang stressed the need to map the harmful jellyfishes in the tropical Western Pacific in view of its increasing social and ecosystem impacts and the lack of information in the region on this emerging issue. The objectives to be achieved through the conduct of three workshops within next two years are to review available data and define knowledge gaps for the analysis of the pattern and trend of the distribution and/or source of harmful jellyfishes in the tropical Western Pacific.

118 This proposal was welcomed and the interest of participation was voiced as jellyfish blooms have been an emerging regional issue and the expected outcomes would help establish the scientific basis for addressing the concern. It was suggested that more interested countries be involved into this Working Group, and consultations with local community may need to be conducted due to lack of historical data and information.

6.3 MARINE RENEWABLE ENERGY TECHNOLOGY DEVELOPMENT IN THE WESTERN PACIFIC

119 Professor Nor Aieni introduced the proposal for a new Working Group on Marine Renewable Energy Technology Development in the Western Pacific (MRET) by referring to the outcomes of the 1st WESTPAC workshop convened in February 2012 in Melaka, Malaysia on “the Status on the Marine Renewable Energy Technology Development in the Western Pacific”. Professor Nor Aieni explained the objectives of this Working Group are to facilitate, monitor and provide technical advice on the development of MRET in the Western Pacific. Expected outcomes include one proposed WESTPAC regional MRET Strategy for short, medium and long term, including objectives and associated activities; regular reports on the regional status on MRET in order to provide baseline information, identify the challenges and share practices among Member States; and regional pilot project proposal(s) on MRET that will serve as learning and collaboration platform and provide mutual benefits to all WG member countries and WESTPAC region.

120 This proposal aroused wide interests and was well received at the session in terms of the significant potential of marine renewable energy to contribute to the future sustainable energy supply, reduction of carbon emission, and the low capacity of Member States in the Western Pacific, particularly Southeast Asian Countries and Pacific Island Countries, for the research and development of marine renewable energy technology.

121 **The Sub-Commission decided** to adopt the Project on “Air-sea Interaction in the Kuroshio Extension and its Climate Impact”, **and establish** two Working Groups respectively on “Mapping the Harmful Jellyfishes in the Western Pacific” with a lifetime of two years, and “Marine Renewable Energy Technology Development in the Western Pacific” with four years’ lifespan.

7. CO-OPERATION WITH OTHER ORGANIZATIONS

122 Mr Zhu reiterated that cooperation with other organizations have been instrumental in revitalizing WESTPAC activities, building partnerships, and sharing resources to achieve all parties' common goals for better directed marine research. Possibilities to co-sponsor the Climate Variability and Predictability (CLIVAR) Pacific Panel with CLIVAR, and joint efforts with IMBER to develop a proposal for capacity building in the Asia-Pacific region on integrated marine biogeochemistry and ecosystem research were given as examples. While continuing its cooperation with current partners, such as PICES, NOWPAP, PEMSEA, and COBSEA, cooperation needs to be strengthened with other international programmes.

IOC Sub-Commission for Africa and Adjacent Island States (IOCAFRICA)

123 Dr Adote Blim Blivi, Vice-Chair of IOC, was invited to speak on the establishment of the IOC Sub-Commission for Africa and Adjacent Island States (IOCAFRICA). He informed the meeting that the first intergovernmental meeting for IOC-Africa was held last month. The Sub-Commission will embark on cooperating with regional entities such as UNEP, Nairobi and Abidjan Conventions. The Sub-commission is in the process of preparing workplans, defining programs, initiating cooperation with relevant institutes and agencies, and cooperating with other subsidiary bodies of IOC that share common interests. Some relevant existing projects to explore partnerships with include ODINAFRICA, GOOS-AFRICA, SCOR, and LME projects.

124 Dr Blivi congratulated WESTPAC on the remarkable achievement made over past five years, and hoped that WESTPAC can serve as a model for IOCAFRICA. In closing Dr Blivi expected to continue the collaboration with and draw upon experience of WESTPAC particularly in involving governments and garnering their support.

UNEP Northwest Pacific Action Plan

125 Dr Alexander Tkalin, Coordinator for the UNEP Northwest Pacific Action Plan (NOWPAP), informed the Session of the NOWPAP's cooperative activities with WESTPAC on the development of regional capacity for remote-sensing data analysis, identification of marine alien species by highlighting the importance to strengthen closer links among international organizations. It was suggested more representatives from other international organizations be invited to attend WESTPAC Sessions, as they could certainly benefit from cooperating with relevant WESTPAC activities.

126 In order to avoid any possible duplication of activities, clarification was sought with regard to one training course to be organized late 2012, or early 2013 in China on the methodology for the integrated marine assessment of the Regular Process. Ms Wang, Chairperson of the Working Group on Regular Process explained that this training will mainly target those young experts, and help them build capacity on the methodology of the integrated marine assessment through sharing information on and common approaches to assessment methodologies.

127 Dr Fangli Qiao emphasized the need to cooperate with the Scientific Committee on Oceanic Research (SCOR) by informing the meeting of one SOCR Working Group Proposal he submitted on Surface Waves in Ocean Circulation and Climate System, and suggesting the cooperation with other leading international marine scientific programmes be of great help to improve the regional scientific capacity.

128 **The Sub-Commission noted** with appreciation the efforts made by the WESTPAC Office, projects and working groups to establish and/or strengthen its cooperation with other international organizations and programmes, and **further encouraged** more concrete cooperation to be established.

8. WESTPAC PROGRAMME AND BUDGET FOR MAY 2012–MAY 2014

129 Mr Zhu presented the Draft WESTPAC Programme and Budget for May 2012–May 2014, referring to Document IOC/SC-WESTPAC-IX/16. This draft was prepared based on the discussions pertaining to the respective agenda items at the present session and the inputs from projects and working groups, serving as a guidance on activities that the Sub-Commission would like to jointly promote, and seek funding from various sources as a result of continuously unsecured financial situation of IOC.

130 WESTPAC is implementing a large number of important projects, and the workplan and budget seems like a daunting task to fulfill given the serious financial situation. Some concerns have been voiced that the inadequate resources may prevent the completion of the workplan.

131 **The Sub-Commission noted with appreciation** the efforts made by the WESTPAC Office particularly in resource mobilization since the last session of the Sub-Commission and the preparation of the draft programme and budget for May 2012–May 2014. **The Sub-Commission requested** all Member States to provide and elevate their support in all possible ways.

132 **The Sub-Commission adopted** [Recommendation SC-WESTPAC-IX.4](#) concerning WESTPAC Programme and Budget for May 2012–May 2014.

9. OTHER MATTERS

133 Dr Dosoo Jang introduced the “Yeosu Declaration,” as a legacy of Expo2012 Yeosu Korea, which is intended not only to enhance the awareness of dangers faced by the sea but also to promote the necessity of international cooperation for turning these challenges into hopes for the future. The Yeosu Declaration covers key contents on the importance of ocean: coasts and islands; maritime culture; interconnectedness; green economy; marine ecosystem; mitigation of the impact and adaptation to climate change; efforts of governments and civil society and actions. He also informed that the Yeosu Declaration Forum will take place on 12 August 2012 with participation of high-level representatives from ocean-related international organizations, and objective to define measures to translate the spirit of the Yeosu Declaration into concrete actions.

134 **The Sub-Commission noted** the information provided by Dr Jang, and believed the experience of developing the Declaration will be of great help for WESTPAC to develop its Regional Ocean Research Priority Plan. **The Sub-Commission expressed appreciation** to the Republic of Korea for incorporating the importance of marine science into this Declaration.

10. ELECTIONS

135 Dr Fangli Qiao, Chair of the Nomination Committee, presented the recommendations of the Committee. Nominations were put forth for the Chairperson, the First and Second Vice-Chairs, in that order, noting that officers can serve for two terms

136 Dr Somkiat Khokiattiwong from Thailand was nominated for the post of Chairperson. The nomination was seconded by the delegates from China and ROK. Dr Youn-Ho Lee was nominated as the First Vice-chair, seconded by Thailand and Indonesia, with primary responsibility to oversee the Advisory Group. Dr Vo Si Tuan was nominated to serve as the Second Vice-chair, with primary responsibility for the organization of the next Scientific Symposium. The nomination was seconded by Japan and ROK.

137 The proposed nominations were unanimously supported by the Sub-Commission, and the three new officers were duly **elected** by acclamation.

138 Dr Khokiattiwong thanked the delegates for their trust and support placed on him to take on the honorable position. He assured the Sub-commission that he would continue to work closely with the Vice-Chairs and WESTPAC Office for securing further success of the Sub-Commission and would put in all efforts to ensure that WESTPAC continues its leading role in marine science research. Dr Lee expressed that he was honored to be given the opportunity to serve as First Vice-Chair. He confirmed that he would continue to forge ahead with WESTPAC's activities, collaborating with relevant entities to promote and expand research in marine sciences. Dr Vo echoed the sentiments expressed by the new Chairperson and First Vice-Chair, and expressed his commitment and readiness to do his best. He thanked all delegates for their confidence and support to Vietnam in hosting the next Scientific Symposium.

11. DATE AND PLACE OF THE NEXT SESSION

139 The Delegation of Thailand offered to host the next session with Phuket proposed as the venue, subject to formal confirmation by the Government of Thailand. However, the session is scheduled to occur in the same year as the 9th Scientific Symposium in Vietnam. Considering the need for the cycle of WESTPAC sessions to be in phase with the IOC reporting cycle, there was a suggestion to consider holding the next session no later than early 2015 before the Twenty-eighth Session of the IOC Assembly in the same year.

140 An inquiry was made if any appropriate mechanism could be explored to discuss and adopt WESTPAC activities for the period from the May 2014 to early 2015 as the Sub-Commission just approved at the present Session its Programme and Budget for the period May 2012- May 2014. Mr Zhu explained that one joint meeting of WESTPAC officers and WESTPAC Advisory Group, serving as one executive meeting, in the mid-2014 could possibly serve the needs as one interim arrangement.

141 **The Sub-Commission accepted with appreciation** the offer by the Government of Thailand to host the Tenth Session in early 2015, subject to the final endorsement by the relevant authorities.

142 In view of the above, **the Sub-Commission adopted** the [Recommendation SC-WESTPAC-IX.5](#) on the date and place of the next session.

12. ADOPTION OF SUMMARY REPORT AND RECOMMENDATIONS

143 Dr Yutaka Michida, Chairperson of the Recommendation Committee, reported to the plenary that the Committee convened two meetings on May 10 and 11 with active participation of eight Member States, China, Indonesia, Japan, Republic of Korea, Malaysia, Russian Federation, Thailand, and Vietnam, and decided to submit five draft recommendations for consideration by the Sub-Commission.

144 Dr Fukuyo called on the delegates to review the draft recommendations paragraph by paragraph, and the draft summary report section by section, taking into account the substantial comments made during the session.

145 **The Sub-Commission adopted** the Summary Report and the recommendations contained therein, which incorporated the amendments accepted by the Sub-Commission.

13. CLOSURE

146 **The Sub-Commission expressed thanks** once again to the Local Organizing Committee for its excellent arrangements and hospitality, and to all delegates and participants for their cooperation and efforts to make the meeting a success. **The Sub-Commission**

extended its high appreciation to all outgoing WESTPAC Officers, WESTPAC Advisory Group for their valuable guidance provided over past four years, particularly to Dr Fukuyo for taking on the role of acting Chair for this session at short notice.

147 **The Sub-Commission highlighted** the recent remarkable achievement made by WESTPAC in the development, coordination and promotion of marine scientific research, observations and capacity building with a view to assisting Member States to address issues affecting sustainable development of marine and coastal resources. It was recognized that the implementation of the WESTPAC revitalization strategy generated positive impacts, which was demonstrated not only by the established WESTPAC framework and collaborative process, but also by the ever-growing number of substantial activities and increasing support, either in cash or in kind, from Member States. The increased commitments of Member States and the dynamic efforts of the WESTPAC Office for resources mobilization, programme development and their passion to serve WESTPAC's interests are considered among key factors behind WESTPAC's recent achievement.

148 While congratulating Dr Khokiattiwong, Dr Lee and Dr Vo on their elections as the new WESTPAC Officers for the term from now until the closure of the next session, **the Sub-Commission expected** that the momentum of WESTPAC should be long kept; the cordial atmosphere and effective working relationship between the present WESTPAC Office and Member States should be maintained; and the quality service provided by the WESTPAC Office should be reinforced.

149 Dr Fukuyo, acting Chairperson, declared the Session closed at 18:20 on 11 May 2012.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATION

- 2.1 ADOPTION OF THE AGENDA
- 2.2 DESIGNATION OF RAPPORTEUR FOR THE SESSION
- 2.3 CONDUCT OF THE SESSION

3. REPORT ON INTERSESSIONAL ACTIVITIES

3.1 REPORT ON INTERSESSIONAL ACTIVITIES

- 3.1.1 Statement of the Chairperson
- 3.1.2 Report by the Regional Office on Intersessional Activities and Budget Overview
- 3.1.3 Operation of the IOC Regional Office for WESTPAC

3.2 RECENT DEVELOPMENTS WITHIN IOC/UNESCO, AND ITS RELEVANCE TO WESTPAC

4. POLICY ISSUES

- 4.1 PERSPECTIVES OF IOC ON THE FUTURE DEVELOPMENT OF SUB-COMMISSION
- 4.2 WESTPAC OCEAN RESEARCH PRIORITY PLAN
- 4.3 THE EIGHTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM IN 2011, REPUBLIC OF KOREA, WITH FOCUS ON LESSONS LEARNT
- 4.4 THE PREPARATIONS FOR THE NINTH WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM, VIETNAM 2014
- 4.5 CELEBRATING THE TWENTY-FIFTH ANNIVERSARY OF WESTPAC

5. REVIEW AND EVALUATION OF REGIONAL PROGRAMMES, PROJECTS AND WORKING GROUPS FOR MAY 2010 - MAY 2012

5.1 MARINE SCIENCE AND APPLICATIONS

- 5.1.1 Harmful Algal Blooms
- 5.1.2 Ocean Remote Sensing
- 5.1.3 Response of Marine Hazards to Climate Change
- 5.1.4 South China Sea Fluvial Sediments and Environment Changes
- 5.1.5 Marine and Coastal Biodiversity and its Management
- 5.1.6 Coral Reef under Climate and Anthropogenic Perturbations
- 5.1.7 Toxic Marine Organisms
- 5.1.8 DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms

5.2 OCEAN OBSERVATIONS AND SERVICES

- 5.2.1 North East Asian Regional-GOOS

- 5.2.2 South East Asian Regional-GOOS , including Monsoon Onset Monitoring and its Social and Ecosystem Impacts, Ocean Forecasting Demonstration System
 - 5.2.3 Marine Hazards Forecasting and Mitigation in the Western Pacific
 - 5.2.4 International Bathymetric Chart of the Western Pacific
 - 5.2.5 Ocean Data & Information Network for the Western Pacific
- 5.3 CAPACITY BUILDING AND PUBLIC AWARENESS
- 5.3.1 UNESCO/IOC Regional Network of Training and Research Centres on Marine Science in the Western Pacific
 - 5.3.2 IOC Regional Training and Research Centre on Ocean Dynamics and Climate
 - 5.3.3 IOC-WMO Regional Marine Instrument Centre for the Asia and Pacific
- 5.4 WESTPAC WORKING GROUPS
- 5.4.1 Working Group on Asian Dust and its Impact on Ocean Ecosystem
 - 5.4.2 Working Group on Regular Process for Global Reporting and Assessment of the State of the Marine Environment
- 5.5 REVIEW OF ON-GOING PROJECTS AND WORKING GROUPS BY THE WESTPAC ADVISORY GROUP
- 6. REVIEW AND APPROVAL OF NEW PROJECT AND WORKING GROUP PROPOSALS**
- 6.1 AIR-SEA INTERACTION IN THE KUROSHIO EXTENSION AND ITS CLIMATE IMPACT
 - 6.2 MAPPING THE HARMFUL JELLYFISHES IN THE TROPICAL WESTERN PACIFIC
 - 6.3 MARINE RENEWABLE ENERGY TECHNOLOGY DEVELOPMENT IN THE WESTERN PACIFIC
- 7. COOPERATION WITH OTHER ORGANIZATIONS**
- 8. WESTPAC PROGRAMME AND BUDGET FOR MAY 2012–MAY 2014**
- 9. OTHER MATTERS**
- 10. ELECTIONS**
- 11. DATE AND PLACE OF THE NEXT SESSION**
- 12. ADOPTION OF SUMMARY REPORT AND RECOMMENDATIONS**
- 13. CLOSURE**

ANNEX II

LIST OF ADOPTED RECOMMENDATIONS

<u>Recommendation SC-WESTPAC-IX.1</u>	WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM
<u>Recommendation SC-WESTPAC-IX.2</u>	TWENTY-FIFTH ANNIVERSARY OF THE IOC SUB-COMMISSION FOR THE WESTERN PACIFIC
<u>Recommendation SC-WESTPAC-IX.3</u>	UNESCO/IOC REGIONAL NETWORK OF TRAINING AND RESEARCH CENTERS ON MARINE SCIENCE IN THE WESTERN PACIFIC
<u>Recommendation SC-WESTPAC-IX.4</u>	WESTPAC PROGRAMME AND BUDGET FOR MAY 2012–MAY 2014
<u>Recommendation SC-WESTPAC-IX.5</u>	DATE AND PLACE OF THE NEXT SESSION

Recommendation SC-WESTPAC-IX.1

WESTPAC INTERNATIONAL SCIENTIFIC SYMPOSIUM

The IOC Sub-Commission for the Western Pacific,

Recalling the decision of its First Session in 1990 that a major multi-disciplinary symposium should become a principal intersessional activity of the Sub-Commission,

Further recalling that WESTPAC International Scientific Symposium is the only scientific series to enhance exchange of marine scientific knowledge in the region,

Having reviewed the outputs and results of the previous symposia, particularly the Eighth WESTPAC International Scientific Symposium on the Ocean Climate and Marine Ecosystems in the Western Pacific, held in Busan, Republic of Korea, 28–31 March 2011,

Expressing its great appreciation to the Government of the Republic of Korea, through its Ministry of Land, Transport and Maritime Affairs, and Korea Ocean Research and Development Institute for having hosted the Symposium,

Having formulated WESTPAC Programme and Budget for May 2012–May 2014,

Bearing in mind the need for presentation and exchange of scientific results in an interdisciplinary forum,

Appreciates the generous offer of the Government of the Socialist Republic of Vietnam to host the ninth Symposium in 2014, Vietnam;

Decides to establish an international scientific steering committee to provide guidance in the formulation of the Symposium Themes, Sub-Themes, Programme, including the scope, contents and structure, under the chairpersonship of the second vice chairperson of the Sub-Commission, Dr Vo Si Tuan;

Recommends that pertinent regional and international organizations be invited to support and participate in the Symposium; and

Encourages all Member States and related international organizations for active participation and contribution to ensure the success of the Symposium.

Recommendation SC-WESTPAC-IX.2

**THE TWENTY-FIFTH ANNIVERSARY OF
THE IOC SUB-COMMISSION FOR THE WESTERN PACIFIC**

The IOC Sub-Commission for the Western Pacific,

Noting that the twenty-fifth anniversary of the Sub-Commission will occur in 2014,

Recognizing the instrumental role of WESTPAC since its inception in 1989 and its achievements made in the development, promotion and coordination of regional programmes in the Western Pacific on marine scientific research, observations, services and capacity building in order to learn more about the nature and resources of the ocean and coastal areas, and 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,

Recognizing also the ever-increasing need, given the fact that the sustainable development of the region heavily relies on the ocean but the knowledge on oceans still remains low, for an intergovernmental presence in the region to improve knowledge exchange between marine scientific community and governmental agencies,

Decides that a series of commemorative activities be planned and organized in 2013–2014 to celebrate the twenty-fifth anniversary of the Sub-Commission, with objectives to (i) take stock of advances in marine sciences and related international cooperation in the Western Pacific; (ii) promote and demonstrate, to governments and to the public, the value and importance of the Sub-Commission's achievements; and (iii) plan for its future directions in marine science, and related sciences and services;

Appreciates the preliminary list of commemorative activities prepared by the Sessional Working Group and considered at the Ninth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-IX, Busan, Republic of Korea, 9–12 May 2012);

Urges Member States to consider national and/or regional initiatives and suggestions to be communicated to the Executive Secretary of IOC for inclusion in the preliminary plan; and

Encourages Member States to provide in- cash or in-kind contribution to the implementation of these commemorative activities.

Recommendation SC-WESTPAC-IX.3

**UNESCO/IOC REGIONAL NETWORK OF
TRAINING AND RESEARCH CENTERS ON MARINE SCIENCE
IN THE WESTERN PACIFIC**

The IOC Sub-Commission for the Western Pacific,

Recognizing the urgent need of Member States for high quality training in specialized fields of marine science in the WESTPAC region,

Bearing in mind the IOC Principles and Strategy for Capacity Building adopted at the Twenty-third Session of IOC Assembly in 2005,

Recalling that the self-driving and sustainable regional capacity building initiative, titled “UNESCO/IOC Regional Network of Training and Research Centers on Marine Science”, together with corresponding Guideline and Procedure was adopted by the Sub-Commission at its Seventh Intergovernmental Session (WESTPAC-VII, Sabah, Malaysia, 26–29 May 2008) and subsequently endorsed by the IOC at the Forty-first Session of its Executive Council (IOC/EC-XLI, Paris, France, 24 June-1 July 2008), and that the regional network will be formed through the establishment of regional training and research centres within the national oceanographic institutes or universities which are willing to provide regular training and research opportunities to the trainees from all WESTPAC Member States on a free-of-charge basis,

Noting with appreciation the great efforts of WESTPAC Office in the promotion of the initiative, and the establishment of the Regional Training and Research Centre on Ocean Dynamics and Climate in the First Institute of Oceanography, State Oceanic Administration of China, which hosted the first regional training course on ocean models from 10–16 June 2011 in accordance with the approved Guideline and Procedures, and Agreement,

Further noting with appreciation the willingness expressed by and positive response received from Indonesia, Malaysia, Republic of Korea and Thailand to contribute to the network through the establishment of IOC Regional Training and Research Centres on the domain of their focus,

Invites Member States to encourage their respective national oceanographic institutes, and universities to actively participate in the Regional Network; and

Requests the Executive Secretary of IOC to follow-up those Member States’ initiatives and take necessary actions to further promote this regional capacity building activity.

Recommendation SC-WESTPAC-IX.4

WESTPAC PROGRAMME AND BUDGET FOR MAY 2012–MAY 2014

The IOC Sub-Commission for the Western Pacific,

Noting the reports of the Technical Secretary for IOC Sub-Commission for the Western Pacific on intersessional activities and the WESTPAC Programme and Budget May 2012–May 2014, contained in documents IOC/SC-WESTPAC-IX/6, 7 and 16,

Expressing its appreciation to the Royal Thai Government's continuing support for the IOC Regional Office for WESTPAC (WESTPAC Office), and these Member States for their in-cash and in-kind contribution in support of the implementation of WESTPAC Programme and Budget for May 2010–May 2012,

Acknowledging the importance of the WESTPAC Office for the success of the programme implementation,

Noting IOC Resolution XXVI-12 adopted at the Twenty-sixth Session of IOC Assembly (IOC-XXVI, Paris, 22 June–5 July 2011) on IOC Biennial Priorities and Implementation Strategy and Draft Programme and Budget for 2012–2013, in which 74.2K USD was allotted to the WESTPAC for its activities over 2012–2013,

Further noting with great concern, however, the recent dramatic reduction of 44.2K USD in the allotment for WESTPAC activities over 2012–2013 as a result of the current financial crisis experienced by the UNESCO and IOC due to the withholding of the United States of America and Israel's assessed contributions to the UNESCO following the General Conference vote admitting Palestine as a Member State of UNESCO,

Recognizing the negative impact of the reduction on the implementation of WESTPAC programmes over 2012–2013,

Decides that the WESTPAC Programme and Budget for May 2012–May 2014 shall be aligned with the High-Level Objectives of the WESTPAC Strategy and the priority areas detailed within the Strategy;

Adopts the Draft WESTPAC Programme and Budget for May 2012–May 2014 given in the Annex to this Recommendation;

Urges Member States to continue and increase their support to WESTPAC and its Office through direct and in-kind contributions; and

Requests the Executive Secretary of IOC and other organizations co-operating with the Sub-Commission to allocate necessary resources and assist in obtaining extrabudgetary funds from governmental and donor agencies.

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
POLICY AND COORDINATION							
Regional Ocean Research Priority Plan	1. Separate Thematic Groups meetings	Draft of each theme	First draft of the RORP	Late 2012 or early 2013	\	20 K	20 K (host)
	2. Organization of RORP drafting group	Finalization of RORP outline; Assignment of thematic groups	Consolidated draft of the RORP	2013 and 2014	\	20 K	20 K (host)
9th WESTPAC International Scientific Symposium	1. International Scientific Steering Committee	<ul style="list-style-type: none"> identify main themes and key sub-themes finalize the programme 	Symposium Programme	Late 2012 and 2013	\	10 K	10 K (host)
	2. Organization of the 9th Symposium	Successful organization of the 9 th Symposium	Proceedings and/or new proposals for WESTPAC	2014 Vietnam	\	10 K	40 K (Vietnam and others)
Executive meetings (WESTPAC Officers, Advisory Group)	Organization of mid-term joint meetings	key issues addressed during the intersessional period	activities reviewed, problems addressed, and guidance provided	Late 2012, and Mid of 2014	6 K	10 K	10 K (host and others)
Operation of WESTPAC Office	Development, coordination and implementation, and resources mobilization of WESTPAC activities;	Efficient and effective operation of the Sub-Commission and implementation of workplan	New activities developed, workplan implemented and quality service provided	May 2012- May 2014 Thailand	24 K	90 K	20 K (Thailand and others)
WESTPAC WORKING GROUPS							
WG001: Asian Dust and its Impact on Ocean Ecosystem (WG-ADOES)	1. 7 th workshop of ADOES	Exchange ideas of methodology, data analyzing and discussion related to this project.	Proceedings	To be determined	\	8 K	8 K (China)
WG002: Regular Process for Global Reporting and Assessment of the State of the Marine Environment (WG-Regular Process)	1. Development of the WESTPAC regional GRAME Strategy	Facilitate the implementation of the Regular Process, improve the communication of member states, and identify regional capacity building needs	WESTPAC regional GRAME Strategy (2012-2015)	Jun 2013	\	8 K	10 K (China)
	2. Co-organization of the Regional S& T Capacity Building workshop; and conduct of WG meeting	strengthen and promote the regional cooperation ; assist, as an initial attempt, in capacity building for the integrated assessments	Summary Report	Sep 2012 Bangkok NOWPAP, COBSEA	\	8 K	
	3. conduct of a training course	Impel the capacity building in carrying out integrated assessments in the region, make the participants better understand and contribute to the RP.	Summary report	2013 Dalian China	\	15 K	15 K (China)
WG003: Mapping the harmful jellyfishes	1. 1st Workshop (Kick-off)	Review the regional concerns on and identify the project	project requirement identified and information collection table formatted	Jul-Sep 2012 Thailand or China	\	6 K	

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
WG003: Mapping the harmful jellyfishes	2. Data Collection	Collect available data	Preliminary dataset distributed	2013	\	\	
	3. 2nd Workshop	Review the data collected	Finalized regional dataset	Sep 2013	\	6 K	
	4. Data Analysis	History and trend study of harmful jellyfish in the region	History and trend; knowledge gaps;future study; publications/recommendation	Aug 2013- Mar 2014	\	\	
	5. 3rd Workshop	Review and discuss study results	Draft publications/new proposal	Apr-May, 2014	\	8 K	
	6. Reporting	Report to the IOC Sub-Commission	Report submitted	Before 31 May 2014	\	\	
WG004: Marine Renewable Energy Technology Development (MRET)	1. Development of the WESTPAC regional MRET Strategy	Preparation of the Regional Status on MRE	Annual reports on the progress of regional status on MRE	Late 2012 Malaysia	\	15 K	
	2. Organize regional pilot projects on MRET	Creation of learning and collaboration platform of MRET	Pilot project initiated	2014	\	5 K	10 K (Malaysia)
MARINE SCIENCE AND APPLICATIONS							
Harmful Algae Bloom (WESTPAC-HAB)	1. Strategic meeting	Discussion on future activities, especially on capacity building and formation of outreach materials	<ul style="list-style-type: none"> list of training courses drafts of outreach material 	2012 Korea (with the 15th IHAB conference)	\	15 K	
	2. Establishment of regional network	Facilitation of information exchange and dissemination	networking	2012-2014	\	\	
	3. Coordination for GEOHAB Asia	Facilitation of enrollment of scientists	Information distribution	Feb 2013	\	\	
	4. Capacity building	Regional and local training courses	Trained scientists and technicians	2012-2014	\	20 K	
	5. Development of HABSEA Portal	Information dissemination to scientists and public	Increased awareness of HAB science	2012-2014	\	\	
	6. Interaction with other HAB projects	Information exchange and collaboration of activities	Enhance effectiveness of activities	2012-2014	\	\	
	7. Production of outreach material	Information dissemination	Better understanding on HAB problems	2012-2014	\	\	3 K (Univ. of Tokyo)
	8. Preparation of textbook	Increase effectiveness of training	Increased skill of HAB monitoring	2013	\	\	25 K (Univ of Tokyo)
Toxic Marine Organisms and their toxins (WESTPAC-TMO)	1. The 3rd workshop	Public outreach materials; and translation of materials in local languages	<ul style="list-style-type: none"> Presentations in the workshop section and the conference Local electronic versions of book 	Oct 2012 Korea	\	\	Jointly with WESTPAC-HAB

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
Toxic Marine Organisms and their toxins (WESTPAC-TMO)	2. The 4th workshop	Confirmation of the final version of webpage	Final version of Webpage	2013, Singapore	\	10 K	10 K (NUS, Singapore)
	3. Printing cost	Public awareness	<ul style="list-style-type: none"> 1000 color copies of flyer A4 500 color copies of poster A1 	Feb 2013	\	5 K	
	4. TMO webpage design	Project information	Webpage finalized and operation	Feb 2014		2 K	
Ocean Remote Sensing Programme (WESTPAC-ORSP)	1. 3 rd Workshop	Analyze initial mapping results of seagrass beds	Suitable mapping methods for seagrass beds discussed. Manual of seagrass mapping prepared.	Oct 2012 Kyoto	\	15 K	10 K (JSPS)
	2. 4 th Workshop	Analyze spatio-temporal change of seagrass beds	Better understanding on spatio-temporal change of seagrass beds Pamphlet prepared	2013	\	15 K	5 K (JSPS)
	3. Publication of pamphlet	Publish English pamphlet	Pamphlet for illuminating local people and stake holders	2013-2014	\	5 K	5 K (JSPS)
	4. 5 th Workshop	Analyze spatio-temporal change of seagrass beds	Submission of manuscripts to a scientific journal	2014	\	10 K	5 K (JSPS)
Response of Marine Hazards to Climate Change (WESTPAC-ROSE)	1. Fourth Joint Cruise in the Western Pacific	Improve regional database on the marine hazards variability	Comprehensive in-situ observations are obtained in pre- and post-typhoon seasons	Western Pacific	\	\	500 K
	2. Fourth International Workshop on Response of Marine Hazards to Climate Change in the Western Pacific: From science to service	Discuss the next step of ROSE project, discuss the establishment of reanalysis data distribution system for the regional ocean forecast system	The joint-action to establish the reanalysis data distribution system		\	\	20 K
Air-sea Interaction in the Kuroshio Extension and its Climate Impact	1. Workshop	Discuss the studies in the Western Boundary Regions	Gain the basic scientific hypothesis of air-sea interaction in the KER	05/2012 Qingdao, China	\	5 K	20 K (China)
	2. Model works	Develop proper modeling approach to explore the air-sea interaction in the KER	Provide a high resolution regional coupled model system	08/2012-03/2015	\	\	100 K (China)
	3. International Cruise and observation in the KER	the international cooperation in the KER observation	Cooperation in the KER observation established; data collected	09/2013-06/2014 KER	\	\	1.5 M (China, Japan)

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
Air-sea Interaction in the Kuroshio Extension and its Climate Impact	4. International Meeting	Summarize	Scientific knowledge shared, and scientific paper prepared and workplan finalized	05/2015 Qingdao, China	\	10 K	30 K (China)
South China Sea Fluvial Sediments and Environmental Changes (WESTPAC-FluSed)	1. Research cruise	Sediment cores and data collection	Case study of shelf in NW South China Sea: shallow seismic dataset, surface and suspended sediments; sediment gravity cores, and hydrological data.	May 2012 Gulf of Tonkin	\	\	50 K (China)
	2. Bilateral workshop in Vietnam	Exchange of scientific results	Strengthen bilateral collaboration: joint master and undergraduate programs, proceedings, field excursion in Vietnam.	Sept. 2012, Hanoi	\	\	15 K (China) 5 K (Vietnam)
	3. 5th FluSed workshop	Exchange of scientific results	Strengthen collaboration: joint writing manuscripts, data comparison, further cooperation discussion.	Nov. 2012, HoChiMinh City	\	4 K	15 K (China) 5 K (local host)
	4. Research cruise	Seismic data and sediments collection	Case study of the Sunda Shelf: shallow seismic dataset, surface and suspended sediments, and sediment gravity cores,.	Aug. 2013, Sunda Shelf	\	\	60 K (China) 60 K (others)
	5. 6th FluSed workshop	Exchange of scientific results	Strengthen collaboration: joint writing manuscripts, data comparison, further cooperation discussion.	Nov. 2013, Indonesia or Singapore	\	4 K	15 K (China) 5 K (local host)
Marine and Coastal Biodiversity and its Management (WESTPAC-MCBM)	1. Workshop: Coral restoration techniques in the WESTPAC region	Share and summarize all coral restoration methods available within WESTPAC	Report/ scientific papers	Sep 2012 Thailand	\	13 K	3 K (DMCR, Thailand and Chulalongkorn University)
	2. development of poster, and pamphlet related to coral conservation and restoration	promote and increase public knowledge and awareness on coral reef restoration and conservation	Report/ poster/ pamphlet	Dec 2012 Thailand	\	4 K	
	3. Workshop: coral/ reef organism taxonomy	Strengthen knowledge on marine biodiversity conservation among WESTPAC countries; promote capacity building and outreach	Summary Report	2013	\	9 K	3 K (DMCR, Thailand and Chulalongkorn University)

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
Marine and Coastal Biodiversity and its Management (WESTPAC-MCBM)	4. Workshop: use of molecular technique for identification and conservation of marine biodiversity	Strengthen knowledge on marine biodiversity conservation among WESTPAC countries; promote capacity building and outreach	Summary Report	2013	\	9 K	3 K (DMCR, Thailand and Chulalongkorn University)
Coral Reef under Climate and Anthropogenic Perturbations (WESTPAC-CorReCAP)	1. 4th workshop	Evaluate the research progress, seek joint research proposals on coral reef study	Summary report and if possible, draft proposal for funding	Second half of 2012, place to be decided	\	5 K	10 K (e.g. China) and/or host organizat'ns
	2. Training activity	Promote the capacity development on coral reef studies	Summary report	First part of 2013, and topic to be decided	\	10 K	10 K (e.g. China) and international resources (e.g. APN)
	3. 5th workshop	Assess research progress on hot spots in relation to coral reefs	Summary report, and if possible, a joint publication	Second half of 2012 or first part of 2014	\	5 K	10 K (e.g. China) and/or host organizat'ns
DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms (DRMREEF)	\	\	\	\	\	\	Pending until funding is available
OCEAN OBSERVATIONS AND SERVICES							
North East Asian Regional-GOOS (NEAR-GOOS)	1. 15th NEAR-GOOS CC meeting	Review the implementations of action points agreed upon at the previous sessions and decide work plan and budget for the next session	Action plans and recommendations on new activities	Oct 2012 Inchon, Korea	\	2 K	8 K
	2. Communications with member states in the region for their involvement in the project	Establish the NEAR-GOOS Working Group on Products and re-construct the NEAR-GOOS Working group on Data Management and etc.		During the intersessional period	\	\	
	3. WG on new NEAR-GOOS products	Improve oceanographic data products and services in the region	Recommendation on new products	2013	\	2 K	8 K
	4. WG on Data Management	Operate NEAR-GOOS databases efficiently and effectively	Improvement of databases operating	2013	\	\	8 K

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
North East Asian Regional-GOOS (NEAR-GOOS)	5. 16th NEAR-GOOS CC meeting	Review the implementations of action points agreed upon at the previous sessions and decide work plan and budget for the next session	Action plans and recommendations on new activities	2013	\	2 K	8 K
	6. 17th NEAR-GOOS CC meeting	Same as the above	Action plans and recommendations on new activities	2014	\	2 K	8 K
South East Asian Regional-GOOS (SEAGOOS)	Monsoon Onset Monitoring over Andaman Sea and its Social and ecosystem impacts (MOMSEI)						
	1. 4th Cruise	Monsoon onset observation	Data and cruise report	Apr 2013 Andaman Sea, Bay of Bengal, tropical eastern Indian Ocean	\	\	100 K (China, Indonesia, Thailand)
	2. 5th Cruise	Monsoon onset observation	Data and cruise report	Apr 2014 Andaman Sea, Bay of Bengal, tropical eastern Indian Ocean	\	\	120 K (China, Indonesia, Thailand)
	3. 6th MOMSEI Expert Workshop	Annual progress review and coordination	Report	Oct 2012 Myanmar	\	2 K	20 K
	4. 7th MOMSEI Expert Workshop	Annual progress review and coordination	Report	Oct 2013 China	\	10 K	
	5. 3rd MOMSEI Summer School	Capacity building	Report	Sep 2012 China	\	\	15 K
	6. 4th MOMSEI Summer School	Capacity building	Report	Sep 2013 Indonesia	\	\	15 K
	Ocean Forecast Demonstration System in the Southeast Asian Seas						
	1. Joint UKM-UMT-FIO Cruises for Peninsular Malaysia Eastern's Shelf (PMES),	To gather and observe various aspect of the region ocean in the region of interest for ocean forecasting system validation	Oceanographic data and enhanced understanding of regional oceanographic processes	Jun 2012 Nov 2012 (Jun, Jul & Nov 2013) PMES	\	\	200 K (UKM, UMT, Malaysia and FIO, China)

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
South East Asian Regional-GOOS (SEAGOOS)	2. Joint PMBC-FIO Cruise for Gulf of Thailand in summer 2012, one cruise.	To gather oceanographic data by CTD (including oxygen, chlorophyll, and turbidity etc.) and ADCP for validation of model.	Understanding of oceanographic aspects and processes of GoT	Jul-Aug 2012	\	\	100 K (PMBC, Thailand and FIO, China)
	3. Development of High Regional Ocean Forecasting System for PMES	To develop a high resolution (1 km) regional ocean forecasting system for PME	High resolution regional ocean model for PMES	UKM & UMT	\	\	100 K (UKM and UMT, Malaysia)
	4. Development of High Regional Ocean Forecasting System for GoT	To develop a high resolution (1 km) regional ocean forecasting system for PMBC (Department of Marine and Coastal Resources; DMCR)	High resolution of GoT for PMBC	PMBC and FIO	\	\	100 K (PMBC, Thailand and FIO, China)
	5. Regional Workshop / Training	Regional workshop for discussing modeling results	Understanding and comparison between modeling results between PMES and GoT	1 in Malaysia (either UMT or UKM) early 2013 & 1 in Thailand in early 2014	\	10 K	10 K (UKM, UMT, Malaysia, and PMBC, Thailand)
	6. Writing and publishing research findings	To write and publish scientific papers especially related to the understanding of regional oceanographic processes within PMES and GoT	Several scientific papers including 1. Mechanism of meso-scale eddy during winter (under review in OD) 2. GoT circulation and exchanges with SCS (manuscript expected in June 2012) 3. Various factors in influencing MLD in Sunda Shelf (manuscript expected in June 2012)	(Malaysia (UKM & UMT), FIO, & Thailand	\	\	Research grants from respective groups
	7. Outreach activities (creation posters, flyers, organizing talks, launching of the forecasting system)	To promote and increase visibility of the project	Increased visibility of the project	Malaysia & Thailand	\	3 K	5 K Research Funding from respective groups
Ocean Data & Information Network for the Western Pacific (ODINWESTPAC)	1. Second Working Group meeting of ODINWESTPAC.	Continue to collect the Needs for Capacity Building and develop the strategy and working plan for the project.	Identification of Capacity build requirement	Late 2012 or early 2013, Tianjin China	\	10 K	15 K (NMDIS, China)

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
Ocean Data & Information Network for the Western Pacific (ODINWESTPAC)	2. Training course	Build the capacity on oceanographic Data and Information collecting, processing , QC/QA	Capacity improved	Late 2012 or early 2013, Tianjin China	\	20 K	15 K (NMDIS, China)
	3. Collection of cruise summary reports in the region.	Provide the information services of the ROSCOP	Cruise summary reports collected Metadata based developed	Start from May 2012 and Continue	\	\	Member States IODE
	4. Development of the ODINWESTPAC Visualization System (OVS)	Integrate, manage and display all marine data and information exchanged ; facilitate the easy access	OSV system, first version	Start from May 2012 and Continue	\	\	Member States IODE
	5. Improvement of the directory of ocean and coastal observations, research and management	Provide the information of the cooperation projects of international and regional to the users in the region.	Directory prepared	Continue	\	\	Member States
	6. Update of the directory of marine libraries and Ocean publications,	Provide the directory and all information services	Directories prepared	Continue	\	\	Member States
	7. Collection of marine data and information	Promote cooperation on data and information and provide good services	Relevant information collected	Continue	\	\	Member States
	8. Maintenance of the ODINWESTPC Website	Provide good services in the region	Well maintained website	Continue	\	\	20 K (NMDIS, China)
	9. Provision of Data Management Guides	Provide guidance on the Data Management	Guidelines provided	End of 2013	\	\	
	10. Third Working Group meeting of ODINWESTPAC	Review the activities, and agree on workplan for next intersessional period	Joint activities identified	2014	\	10 K	15 K (NMDIS, China)
	International Bathymetric Chart of the Western Pacific (IBCWP)	1. Establishment of a technical network	exchange bathymetric mapping techniques and its application in risk assessment	A expert correspondence network	ASAP	\	\
2. Organization of the first technical session		To exchange bathymetric mapping techniques, promote the regional cooperation in this field	Knowledge sharing among member states	End of 2013	\	\	15 K (NMDIS, China)
3. Preparations of one proposal on WESTPAC Working Group		To develop a complete proposal	A complete proposal to be submitted to the next Session for approval.	First half of 2014	\	\	3 K (NMDIS, China)

Project/Programme	Activities	Objectives	Expected outputs	Date and place	Funding Required, US\$			
					IOC (in-cash)		Other in-kind sources (national or internat'l)	
					Regular	Extra budget		
CAPACITY DEVELOPMENT AND PUBLIC AWARENESS								
IOC Regional Training and Research Center on Ocean Dynamics and Climate								
IOC Regional Network of Training and Research Centers on Marine Science	1. Second training course	Ocean dynamics	Improved understanding on the basic ocean processes and its dynamics	July 2012, Qingdao, China	\	2 K	30 K (ODC Center, China)	
	2. Third training course	Air-sea interaction	Improved understanding on the air-sea interaction and its effects on the climate system.	Summer of 2013, Qingdao, China	\	2 K	30 K (ODC Center, China)	
	3. Fourth training course	Climate models	Improved understanding of the wave-circulation coupled theory and practices on climate models.	Summer of 2014, Qingdao, China	\	2 K	30 K (ODC Center)	
	IOC-WMO Regional Marine Instrument Center for the Asia and Pacific (Asia-Pac RMIC)							
	1. Workshop on CTD calibration	Increase the level of CTD calibration of the member states	Training on theory and on-site experiment of CTD calibration, and data processing	Nov. 2012 Tianjin, China	\	\	10 K Asia-Pac RMIC	
	2. Calibration workshop for float-type tide gauge and wave buoy	Increase the level of tide gauge and wave buoy calibration	Training on theory and on-site experiment of CTD calibration, and data processing	Sept. 2013 Tianjin, China	\	\	10 K Asia-Pac RMIC	
	3. Cooperation on Marine standard	promote cooperation on Marine Standards	China's observation standards and marine instrument calibration specifications into English for	2012-2014	\	\	30 K Asia-Pac RMIC	
	4. Provision of calibration services	Increase calibration ability of member states, ensure observation data can be traced back to SI	Provide calibration services on Water Conductivity(salinity)/ temperature/ pressure/tide/wave	2012-2014 Tianjin, China	\	\	20 K Asia-Pac RMIC	
	Sub-total					30 K	493 K	3,738 K
	Total					4,261 K		

Recommendation SC-WESTPAC-IX.5

DATE AND PLACE OF THE NEXT SESSION

The IOC Sub-Commission for the Western Pacific,

Bearing in mind the need for a sufficient period of time between sessions of the Sub-Commission to allow a reasonable implementation of its activities,

Recalling Recommendation SC-WESTPAC-I.3 in 1990 to have a three-yearly time span between its regular sessions,

Further recalling the Recommendation SC-WESTPAC-VII.6, adopted at the Seventh Session of the Sub-Commission (WESTPAC-VII, Sabah, Malaysia, 26–29 May 2008), which decides to reschedule the period between sessions from three years to two years beginning with the close of WESTPAC-VII, to be in phase with IOC planning cycles. Further, WESTPAC sessions will be scheduled for the first quarter of the year so its decisions, recommendations, and reports can be forwarded to the IOC Executive Secretary in time for review and consideration by the Assembly,

Appreciates the Government of the Republic of Korea for hosting the Ninth Intergovernmental Session on 9–12 May 2012, Busan, Republic of Korea and excellent arrangements made for the session; and

Accepts with appreciation the offer by the Government of Thailand to host the Tenth Intergovernmental Session no later than early 2015, subject to the final endorsement of the relevant authorities.

ANNEX III

OPENING REMARKS

Opening Remarks of Dr Weong-Seo Kim, Vice-President of KORDI

I am honored to take this opportunity to deliver this opening remarks on behalf of the President of KORDI. Unfortunately, President Kang could not make to this event at the final minute, because he is indicated to attend another meeting that is being held and exactly overlapped with this meeting.

He has to give a presentation on KORDI's marine plant projects to the national President of Korea, Lee Myung-bak, who is visiting Busan this morning.

Honorable Mr Sung-Ho Joo, Vice-Minister of the Ministry of Land, Transport and Maritime Affairs;

Honorable Dr Young Hwal Lee, Vice-Mayor of Busan Metropolitan City;
Dr Sangkyung Byun, Chair of IOC;
Dr Wendy Watson-Wright, Executive Secretary of IOC;
Distinguished Delegates of Member States;
Distinguished Representatives of International Organizations, and Ladies and Gentlemen,

I have the honor of opening this 9th Intergovernmental Session of IOC-WESTPAC in Busan, the Korea's largest coastal city vibrant with marine industry and activities.

It must be true that I have met many of you in Busan about a year ago when we hosted the 8th WESTPAC International Scientific Symposium just at this place. Time flies quite fast.

WETSPAC! Welcome back to Busan again.

I visited Washington DC, United States of America, in the middle of last April. It was a coincidence that both Dr Watson-Wright and I were in the same town, although we did not have a chance to meet each other.

I guessed that Dr Watson-Wright must be in DC to try to find out the most suitable solution for overcoming the recent financial difficulty facing UNESCO. I wish that this financial crisis would be overcome so smoothly that IOC could continue its mission in schedule.

Largely, Korea has two major interests towards WESTPAC. The first interest is to try to spread out over the WESTPAC Region technical skills and knowledge about how to increase capabilities of marine forecasting and prediction by using a tool of operational oceanography.

I have no doubts that the improvement of marine forecasting capabilities can contribute to the reduction of the loss of property and life from natural disasters, more efficient and rapid response to oil spills, and more accurate search and rescue at sea.

Another interest is to study about marine genetic and biological information in need for wise and smart management of marine resources in a sustainable manner, particularly, a study on interdependence and interconnectedness between physical oceanographic data and biological information. No matter whatsoever, the ultimate goal of marine science in general is to understand the phenomena of biological changes in the ocean.

The Western Pacific Region is regarded as one of the most productive areas in terms of marine life. In this regard, I hope that the leaders of the WESTPAC could have a chance to

bring about an idea of initiating at least one big landmark regional project including physical, biological, and chemical oceanography that can be beneficial for all member states.

In closing, I wish this 9th WESTPAC Meeting a great success, and wish you a luck while staying in Busan.

Thank you!

Opening Remarks of Mr Sung-Ho Joo
Vice-Minister of Ministry of Land, Transportation and Maritime Affairs, Republic of Korea

Dr Sangkyung Byun, Chair of IOC;
Dr Wendy Watson-Wright, Executive Secretary of IOC;
Dr Yasuwo Fukuyo, First Vice-Chair of WESTPAC;
And Distinguished National Delegates to IOC/WESTPAC

Warmly welcome to the Republic of Korea.

Dr Young Hwal Lee, Vice Mayor of Busan Metropolitan City;
Dr Weong-Seo Kim, Vice-President of KORDI;
And Distinguished Guests

Thank you all for joining us despite your busy schedule.

On behalf of the host country, I truly congratulate to you all to convene the 9th Intergovernmental Session of the IOC Sub-commission for the Western Pacific.

We are more than happy with you come across from 11 countries. Also we are very pleased to host this Meeting at a beautiful coastal city Busan, which is one of the most vital coastal cities of Asia.

Since the WESTPAC was established in 1989, we believe that it has contributed to the improvement of the capabilities of ocean observation, exchange and sharing of observed data and information, and ecosystem research.

Especially, many scientists are interested or involve in studying on marine biodiversity bountiful in the Western Pacific Region. Korea also has funded continuously to study on marine biodiversity and its genetics. Forwards, Korea will continue such research for better understanding of the marine ecosystem.

Ladies and gentlemen,

In a situation where land-based resources are becoming scarce, our ocean becomes more in attention as a treasury essential for the continued survival and prosperity of humankind.

However, our ocean and coastal areas have been threatened by marine pollutants and debris, ocean acidification, tsunami, sea-level rise, and so on.

Of course, our world society is making efforts to find the answers for coastal problems impacted by human induced influences and to expand the systems for observing and monitoring our ocean and coasts.

The Korea Ministry of Land, Transport and Maritime Affairs is leading our national attempts to expand ocean and coastal observation systems, and invest gradually more and more on research on climate change

I do hope that this 9th WESTPAC Meeting will be an excellent venue capable for the exchange of knowledge and expertise among the participating member states.

Before closing, I beg your permission to introduce to the Expo 2012 Yeosu Korea which will be held from May 12 to August 12, 2012 under the main theme of “Living Ocean and Coast”.

If you go there, you will see many events and activities related to our ocean and coasts. Korea has considered deeply, through this Expo, as to what to show to the people; how the humankind could find resolutions for our ocean related issues; and how much the world could reduce the level of CO2 by investing on the development of ocean renewable energy.

The Expo are also trying to present the importance of international concerted efforts for strengthening the capabilities of developing countries including small island states for addressing their own issues related to the ocean and coasts.

I know that you all will travel to Yeosu Expo coming Saturday. If you will visit there, I commend you to enjoy the best of the view of Rias coast and exhibition of Yeosu EXPO.

In closing, I would like to thank KORDI, WESTPAC Secretariat, and Busan Metropolitan City for their thorough organization, preparation, or sponsorship.

I look forward to this meeting fruitful and wish you all healthy and enjoy your time while staying in Busan.

Thank you.

Opening Remarks of Dr Wendy Watson-Wright
Executive Secretary of IOC

Your Excellency, Mr Sung-Ho Joo, Vice-Minister of Ministry of Land, Transportation and Maritime Affairs, Republic of Korea;

Dr Sangkyung Byun, Chair of IOC;
Dr Yasuwo Fukuyo, First Vice-Chair of WESTPAC;
Dr Weong-Seo Kim, Vice-President of KORDI;
Dr Young-Hwal Lee, Vice-Mayor of Busan City;
Distinguished delegates;
Ladies and Gentlemen,

Good Morning! It gives me great pleasure to meet with you, and it is an honour to deliver opening remarks at this 9th Intergovernmental Session of the IOC Sub-Commission for the Western Pacific. On behalf of the IOC and Director-General of UNESCO, I would like to thank the Government of the Republic of Korea for hosting this session and for all the excellent arrangement made for us here in the beautiful coastal city of Busan.

I still remember that two years ago at last session of WESTPAC in Bali, I highlighted the great changes taking place for this Sub-Commission over recent years and I said that I expected the momentum of WESTPAC would continue. Two years later, I will say here with confidence that the work of the Sub-Commission has not only met my expectations, but also been brought to a new high.

As a result of continuous efforts of member states and the WESTPAC Office, this IOC Sub-Commission has been fully demonstrating its indispensable role in delivering and expanding the service of IOC to member states in the region, by promoting regional cooperation

on marine scientific research, observations and capacity building in order to assist member states in the study and management of their coasts and ocean resources. We gladly note that great contributions have been made from WESTPAC via a variety of region-specific activities in support of IOC global efforts, for instance, the 50th anniversary of IOC, the Regular Process for Global Reporting and Assessment of the state of Marine Environment (GRAME), the development of the Global Ocean Observing system (GOOS) and IOC Self-driven capacity building. I would particularly highlight its unique regional Capacity Building initiative titled "IOC Regional Network of Training and Research Centers on Marine Science" which was initiated for the first time in IOC. This is testament to the strong commitment of the Member States in this region to promote North-South and South-South cooperation, while providing valuable experience that can be shared with other regions.

While being encouraged by the achievements in the region, I would like to share with you some opportunities provided for as well as pressing challenges faced by IOC.

On the opportunities side, first is Rio + 20. Based on the resolution approved by the last session of the IOC Assembly, IOC has worked hard to raise the profile of the ocean in the preparations for the Rio+20 Conference on Sustainable Development, and we have successfully done so through the recent launch of the report and summary for decision makers, *A Blueprint for Ocean and Coastal Sustainability* and through engagement in the Rio preparatory process.

It is important for IOC to remain engaged in this extraordinary event, and position itself to carry forward work with Member States in the coming decades to improve the sustainability of the human relationship with the ocean. A number of key objectives for the ocean at Rio+20 are being defined, from the Regular Process, to ocean acidification, from marine protected areas to capacity building. We now need to work with UN Member States in order to get support for these objectives and reach consensus that will, we hope, translate in the outcome document.

Among future activities are the organization of: participation in the ICSU Forum on Science, Technology for Sustainable Development (June); the Ocean Day at Rio+20 (16 June), an EU side event on ocean acidification, and an IOC-led side event entitled **Healthy Ocean, Healthy People: Knowing our Ocean, Protecting our Marine Treasures, Empowering Ocean Citizens**.

Second is Expo 2012 Yeosu Korea with the theme "The Living Ocean and Coast: Diversity of Resources and Sustainable Activities" from May 12 to Aug. 12, 2012. The IOC has been involved with consultations with the Expo 2012 Yeosu Korea since 2009 and is participating in the Yeosu Expo in several modes. Two major events are being co-organized by the IOC at the Expo: the 2nd ICES-PICES-IOC International Symposium on the "Effect of Climate Change on the World's Oceans" (15-19 May 2012), and the Fourth Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (23-31 May 2012).

In terms of challenges, of course foremost is the financial challenge experienced by UNESCO and its IOC. Following the UNESCO General Conference vote admitting Palestine as a Member State of UNESCO, the United States of America and Israel have withheld their assessed contributions (22,38% of UNESCO totals), resulting in Regular Programme budget deficit of US\$ 72 million for 2011 and a projected budget shortfall of US\$ 146 million for 2012–2013. For the IOC this is a cut of US\$ 3.2 million for 2012–2013. Even with utilizing what little flexibility there is in staff allocation, the reduction translates into a 77% cut to resources for activities. At this level of cut, the IOC risks losing its recognized leadership in ocean science, observations, data management, and services.

Ladies and Gentlemen,

IOC is facing a new and challenging situation that is not easy, that calls for the best from each of us. This is a time for unity, a time for all countries to pull together with IOC, to ensure the continued delivery of its competence and its global leadership in marine scientific research, observations and service, as well as capacity building.

To this end, I will look to WESTPAC, a regional arm of IOC, to assist the IOC, by working very closely with our Member States in the region to overcome the difficulties we face and strengthen the presence of IOC in the region. We have gladly noted the rising spirit of cooperation among member states, ever-increasing extrabudgetary support to WESTPAC, and unprecedented numbers of participants and activities conducted over recent years.

As such I wish to express my sincere appreciation to those member states in the region for your great efforts and considerable contributions made in developing and implementing IOC programmes. I sincerely hope these efforts will continue into the future to the greatest extent possible.

I would like to conclude my short remarks by expressing my sincere thanks once again to the Government of the Republic of Korea for providing us with such friendly and generous hospitality here, and more specifically to the Ministry of Land, Transportation and Maritime Affairs, Korea Ocean Research and Development Institute for your very efficient organization of this session. Thank you very much!

Opening Remarks of Dr Yasuwo Fukuyo, First Vice-Chair of WESTPAC

Your Excellency, Mr Sung-Ho Joo, Vice-Minister of Ministry of Land, Transportation and Maritime Affairs, Republic of Korea;

Dr Weong-Seo Kim, Vice-President of KORDI;
Dr Young-Hwal Lee, Vice-Mayor of Busan City;
Dr Sangkyung Byun, Chair of IOC;
Dr Wendy Watson-Wright, Executive Secretary of IOC;
Distinguished delegates;
Ladies and Gentlemen,

Good morning!

It is my honor to attend and address to the opening ceremony of the Ninth Intergovernmental Session of the IOC Sub-commission for the West Pacific. First, please allow me, on behalf of officers of IOC/WESTPAC, to express my congratulation to the opening of the meeting and extend my warm welcome to all delegates and guests. Also, I would like to express my sincere gratitude to the government of Republic of Korea for kindly hosting this meeting in such a nice hotel.

IOC/WESTPAC was established in 1989. As a major subsidiary body of IOC in the West Pacific region, WESTPAC devotes itself to develop, coordinate and implement regionally specific marine scientific research, ocean observations and services based on priority interests of the Member States and to implement the IOC global programmes and activities at regional level. During the past two decades, IOC/WESTPAC has made great contributions in promoting international marine cooperation and communication in the West Pacific region. In the year of 2008, IOC/WESTPAC developed and adopted its new Strategy and Programme Structure. And since then, we conducted a series of activities to reform the framework and mechanisms of WESTPAC. Many new cooperative projects were initiated and implemented by Member States, which highly boosted visibility and influence of WESTPAC. Currently, we could proudly say that IOC/WESTPAC has become one of the most active and energetic international organizations in this region.

The development of IOC/WESTPAC relies on the support of all Member States. Since its establishment, the IOC/WESTPAC has been receiving continuous assistance from many countries. Among others, the Thai government provided offices, facilities and personnel support to WESTPAC secretariat for long time; China, Japan, Republic of Korea, and Thailand made sustainable financial donation; while many countries provided considerable in-kind support to the implementation of WESTPAC activities. Besides, support from the headquarters of IOC as well as other international and regional organizations and programmes were also of great significance for WESTPAC in performing its duties. Taking this opportunity, I would like to extend my heartfelt thanks to all Member States, IOC and WESTPAC secretariat, and relevant international organizations for your continuous support and contributions to IOC/WESTPAC.

Ladies and Gentlemen,

2012 is a special year for ocean. Many important ocean events will occur this year. It is the 30th anniversary of the opening for signature of the United Nations Convention on the Law of the Sea. Expo 2012 Yeosu with the theme of *the Living Ocean and Coast* as well as several international ocean meetings, including the *East Asian Seas Congress* and *Global Forum on Oceans, Coasts and Island*, will be organized in the Republic of Korea. All these occasions will further promote the international society's understanding on the importance of the seas. In this kind of context, we have every reason to enhance the role and function of IOC and WESTPAC. And I am confident that IOC and WESTPAC will achieve more successes in the future.

I wish the meeting a full success.

Opening Remarks of Mr Young-Hwal Lee, Vice-Mayor of Busan City,

Good morning, ladies and gentlemen.

It is my great pleasure to be here at the opening of the 9th Intergovernmental Session of the IOC Sub-Commission for the Western Pacific in Busan.

Let me extend my warmest welcome to Dr Wendy Watson-Wright, IOC Executive Secretary, Dr Yasuwo Fukuyo, First Vice-Chair of WESTPAC and all the other WESTPAC members to Busan. It is very nice to meet you all.

I'd also like to thank Vice-Minister Joo, Sung-ho of the Ministry of Land, Transport and Maritime Affairs and President Kang, Jung-Keuk of Korea Ocean Research and Development Institute for all your hard work organizing this event.

Since its establishment in 1989, the IOC/WESPAC has greatly contributed to the development of ocean science and the oceanic environment, not only in the Western Pacific Region but right around the world, conducting international R&D projects, expanding the use of the Global Ocean Observing System in the Western Pacific and ensuring the efficient and widespread sharing of ocean data, knowledge and information obtained from research and monitoring.

It is particularly meaningful that Busan is playing host to an important IOC/WESTPAC event for the second time, following on so soon after the 8th IOC/WESTPAC International Scientific Symposium last year.

As Korea's maritime capital and international trading port city, Busan is the proud host of the annual World Ocean Forum, Korea's largest ocean conference, facilitating exchange and cooperation among global ocean industry professionals.

As a responsible member of the international community, Busan pledges to actively participate in developing ocean science and technology as well as in addressing the environmental crisis facing our oceans due to global climate change.

I look forward to this intergovernmental session further promoting international cooperation in ocean science and technology development, and a healthier marine ecosystem, as well as greater prosperity and a brighter future for mankind.

I wish the IOC/WESTPAC and each of you every success in all your ventures. Thank you.

ANNEX IV

LIST OF DOCUMENTS

Document Code	Title	Agenda Items
<u>Working Documents</u>		
IOC/SC-WESTPAC-IX/1.prov.	Provisional List of Documents	All
IOC/SC-WESTPAC-IX/2.prov.	Provisional Agenda	2.1
IOC/SC-WESTPAC-IX/2.add.prov.	Provisional Timetable	2.1
IOC/SC-WESTPAC-IX/3.prov.	Provisional Annotated Agenda	All
IOC/SC-WESTPAC-IX/4	Draft Summary Report	--
IOC/SC-WESTPAC-IX/5	Statement of the Chairperson	3.1.1
IOC/SC-WESTPAC-IX/6	Report by the Regional Office on Intersessional Activities	3.1.2
IOC/SC-WESTPAC-IX/7	Report by the Regional Office on Budget Overview	3.1.2
IOC/SC-WESTPAC-IX/8	Recent Developments within IOC/UNESCO and its Relevance to WESTPAC	3.2
IOC/SC-WESTPAC-IX/9	Progress on the WESTPAC Ocean Research Priority Plan	4.2
IOC/SC-WESTPAC-IX/10	Report on the Eighth WESTPAC International Scientific Symposium in 2011, Busan, Republic of Korea, with Focus on Lessons Learnt	4.3
IOC/SC-WESTPAC-IX/11	Progress on the preparations for the Ninth WESTPAC International Scientific Symposium in 2014, Vietnam	4.4
IOC/SC-WESTPAC-IX/12	Review and Evaluation of Regional Programmes, Projects and Working Groups for May 2010 – May 2012	5
IOC/SC-WESTPAC-IX/12.1	Progress Report on Harmful Algal Blooms	5.1.1
IOC/SC-WESTPAC-IX/12.2	Progress Report on Ocean Remote Sensing	5.1.2
IOC/SC-WESTPAC-IX/12.3	Progress Report on Response of Marine Hazards to Climate Change	5.1.3
IOC/SC-WESTPAC-IX/12.4	Progress Report on Fluvial Sediments to the South China Sea	5.1.4
IOC/SC-WESTPAC-IX/12.5	Progress Report on Marine and Coastal Biodiversity and its Management	5.1.5
IOC/SC-WESTPAC-IX/12.6	Progress Report on Coral Reef under Climate and Anthropogenic Perturbations	5.1.6

IOC/SC-WESTPAC-IX/12.7	Progress Report on Toxic Marine Organisms	5.1.7
IOC/SC-WESTPAC-IX/12.8	Progress Report on DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms	5.1.8
IOC/SC-WESTPAC-IX/12.9	Progress Report on North East Asian Regional-GOOS (NEAR-GOOS)	5.2.1
IOC/SC-WESTPAC-IX/12.10	Progress Report on South East Asian Regional-GOOS (SEAGOOS), including Ocean Forecasting Demonstration (OFD), and Monsoon Onset Monitoring and its Social and Ecosystem Impacts (MOMSEI)	5.2.2
IOC/SC-WESTPAC-IX/12.10.1	Progress Report on SEAGOOS - Monsoon Onset Monitoring and its Social and Ecosystem Impacts (MOMSEI)	5.2.2
IOC/SC-WESTPAC-IX/12.10.2	Progress Report on SEAGOOS - Ocean Forecasting Demonstration (OFD)	5.2.2
IOC/SC-WESTPAC-IX/12.11	Progress Report on Marine Hazards Forecasting and Mitigation in the Western Pacific	5.2.3
IOC/SC-WESTPAC-IX/12.12	Progress Report on International Bathymetric Chart of the Western Pacific (IBCWP)	5.2.4
IOC/SC-WESTPAC-IX/12.13	Progress Report on Ocean Data & Information Network for the Western Pacific (ODINWESTPAC)	5.2.5
IOC/SC-WESTPAC-IX/12.14	Progress Report on UNESCO/IOC Regional Network of Training and Research Center on Oceanography in the Western Pacific”	5.3.1
IOC/SC-WESTPAC-IX/12.15	Progress Report on IOC Regional Training and Research Center on Ocean Dynamics and Climate	5.3.2
IOC/SC-WESTPAC-IX/12.16	Progress Report of “IOC-WMO Regional Marine Instrument Center for the Asia and Pacific”	5.3.3
IOC/SC-WESTPAC-IX/12.17	Progress Report on WESTPAC Working Group on Asian Dust and its Impact on Ocean Ecosystem	5.4.1
IOC/SC-WESTPAC-IX/12.18	Progress Report on WESTPAC Working Group on Regular Process for Global Reporting and Assessment of the State of the Marine Environment	5.4.2

IOC/SC-WESTPAC-IX/13	New Project Proposals	6
IOC/SC-WESTPAC-IX/13.1	Air-Sea Interaction in the Kuroshio Extension and its Climate Impact	6
IOC/SC-WESTPAC-IX/13.2	Mapping the Harmful Jellyfishes in the Tropical West Pacific Waters	6
IOC/SC-WESTPAC-IX/14	New proposals on WESTPAC Working Groups	7
IOC/SC-WESTPAC-IX/14.1	Marine Renewable Energy Technology Development in the Western Pacific (MRET)	7
IOC/SC-WESTPAC-IX/15	Cooperation with Other Organizations	8
IOC/SC-WESTPAC-IX/15.1	Statement of UNEP/Northwest Pacific Action Plan (NOWPAP) on the Cooperation with IOC/WESTPAC	8
IOC/SC-WESTPAC-IX/16	Draft WESTPAC Workplan and Budget for May 2012 – May 2014	9
<u>Information Documents</u>		
IOC/SC-WESTPAC-IX/inf.1	Information on Services Available	--
IOC/SC-WESTPAC-IX/inf.2	Provisional List of Participants	--
IOC/SC-WESTPAC-IX/inf.3.1	Summary Report of the Eighth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VIII), Bali, Indonesia, 10-13 May 2010	All
IOC/SC-WESTPAC-IX/inf.3.2	Executive Summary of the Eighth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VIII), Bali, Indonesia, 10-13 May 2010	All
IOC/SC-WESTPAC-IX/inf.4.1	Summary Report of the Seventh Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26-29 May 2008	All
IOC/SC-WESTPAC-IX/inf.4.2	Executive Summary of the Seventh Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26-29 May 2008	All
<u>Harmful Algal Blooms</u>		
IOC/SC-WESTPAC-IX/inf.5	Summary Report of the IOC/WESTPAC Workshop on Harmful Algal Blooms (WESTPAC-HABs) “Charting the Future for the Research on Harmful Algal Blooms in the Western Pacific”, Nha Trang, Vietnam, 15-17 March 2012	5.1.1

IOC/SC-WESTPAC-IX/inf.6	Summary Report of the IOC/WESTPAC Training Course on Taxonomy and Ecology of Diatom Pseudo-nitzschia, Sarawak, Malaysia, 20-23 March 2011	5.1.1
IOC/SC-WESTPAC-IX/inf.7	<u>Ocean Remote Sensing</u> Summary Report of the IOC/WESTPAC Workshop on “Remote Sensing for Coastal Habitat Mapping” (WESTPAC-ORSP-II), Johor, Malaysia, 28-30 November 2011	5.1.2
IOC/SC-WESTPAC-IX/inf.8	Summary Report of the NOWPAP/PICES/WESTPAC Joint Training Course on Remote Sensing Data Analysis, Vladivostok, Russia, 8- 12 October 2011	5.1.2
IOC/SC-WESTPAC-IX/inf.9	<u>Fluvial Sediments to the South China Sea</u> Summary Report of the Fourth IOC/WESTPAC International Workshop on the Fluvial Sediment Supply to the South China Sea (WESTPAC-FluSed-IV), Bangkok, Thailand, 14-16 December 2011	5.1.4
IOC/SC-WESTPAC-IX/inf.10	Summary Report of the Third IOC/WESTPAC Workshop on the Fluvial Sediment Supply to the South China Sea (WESTPAC-FluSed-III), Manila, Philippines, 17-18 November 2010	5.1.4
IOC/SC-WESTPAC-IX/inf.11	<u>Marine and Coastal Biodiversity and its Management</u> Summary Report of the IOC/WESTPAC-PICES Joint Workshop on Rapid Assessment Survey Methodologies for Detecting Marine Non-Indigenous Species (WESTPAC- RAS-III), Phuket, Thailand, 19-21 July 2011	5.1.5
IOC/SC-WESTPAC-IX/inf.12	Summary Report of the IOC/WESTPAC Workshop on Rapid Assessment Survey of Marine Biodiversity and Non-Indigenous Species in the Western Pacific Region (WESTPAC-RAS-II), Bangkok, Thailand, 6-9 December 2010	5.1.5
IOC/SC-WESTPAC-IX/inf.13	Summary Report of the IOC/WESTPAC Workshop on Rapid Assessment Survey of Marine Biodiversity and Non-Indigenous Species in the Western Pacific Region (WESTPAC-RAS-I), Bangkok,	5.1.5

	Thailand, 20-21 September 2010	
	<u>Coral Reef under Climate and Anthropogenic Perturbations</u>	
IOC/SC-WESTPAC-IX/inf.14	Summary Report of the Second IOC/WESTPAC Training Course on “Water Quality and its Impact on Coral Reefs” (WESTPAC-CorReCAP-T.II), Sanya, China, 8-11 June 2011	5.1.6
IOC/SC-WESTPAC-IX/inf.15	Summary Report of the IOC/WESTPAC Training Course on “Impact of Sedimentary Dynamics and Biogeochemistry on Coral Reefs” (WESTPAC-CorReCAP-T.I), Koh Samui, Thailand, 15-18 June 2010	5.1.6
IOC/SC-WESTPAC-IX/inf.16	Summary Report of the Second IOC/WESTPAC Workshop on the Coral Reef under Climate and Anthropogenic Perturbations (WESTPAC-CorReCAP-II), Phuket, Thailand, 22-24 June 2010	5.1.6
	<u>Toxic Marine Organisms</u>	
IOC/SC-WESTPAC-IX/inf.17	Summary Report of the IOC/WESTPAC Training Course on “Immunological Method for Detection of Domoic Acid in Plankton and Shellfish”, Nha Trang, Vietnam, 19-22 March 2012	5.1.7
IOC/SC-WESTPAC-IX/inf.18	Summary Report of the Second IOC/WESTPAC Workshop on “Toxic Marine Organisms” (WESTPAC-TMO-II), Nha Trang, Vietnam, 4-6 November 2011	5.1.7
IOC/SC-WESTPAC-IX/inf.19	Summary Report of the IOC/WESTPAC Workshop on "Enhance the Awareness on Toxic Marine Organisms"(WESTPAC-TMO-I), Nha Trang, Vietnam, 13-15 December 2010	5.1.7
	<u>North East Asian Regional-GOOS (NEAR-GOOS)</u>	
IOC/SC-WESTPAC-IX/inf.20	Summary Report of the Fourteenth Session of IOC/WESTPAC Coordinating Committee for NEAR-GOOS (WESTPAC-NEARGOOS-XIV), Tianjin, China, 8-9 September 2011	5.2.1
	<u>South East Asian Regional-GOOS (SEAGOOS)</u>	
IOC/SC-WESTPAC-IX/inf.21	Summary Report of the Second Workshop of IOC/WESTPAC on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration (WESTPAC/SEAGOOS-OFD-II), Qingdao, China, 14 December 2011	5.2.2

IOC/SC-WESTPAC-IX/inf.22	Summary Report of the First Workshop of IOC/WESTPAC on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration (WESTPAC/SEAGOOS-OFD-I), Phuket, Thailand, 30 September – 1 October 2010	5.2.2
IOC/SC-WESTPAC-IX/inf.23	Summary Report of the Fifth IOC/WESTPAC Expert Workshop on the Pilot Project of SEAGOOS on the Monsoon Onset Monitoring and its Social and Ecosystem Impacts (WESTPAC/SEAGOOS-MOMSEI-V), Yogyakarta, Indonesia, 28-30 September 2011	5.2.2
IOC/SC-WESTPAC-IX/inf.24	Summary Report of the Fourth IOC/WESTPAC Expert Workshop on the Pilot Project of SEAGOOS on the Monsoon Onset Monitoring and its Social and Ecosystem Impacts (WESTPAC/SEAGOOS-MOMSEI-IV), Melaka, Malaysia, 27-29 December 2010	5.2.2

ANNEX V

LIST OF PARTICIPANTS

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ANNEX VI

LIST OF ACRONYMS

ADOES	Asian Dust and its Impact on Ocean Ecosystem
CLIVAR	Climate Variability and Predictability
COBSEA	Coordinating Body on the Sea of East Asia
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GOOS	Global Ocean Observing System
GRAMME	Global Reporting and Assessment of the State of the Marine Environment
HAB	Harmful Algal Blooms
IBCWP	International Bathymetric Chart of the Western Pacific
ICES	International Council for the Exploration of the Sea
ICG/PTWS	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
IGBP	International Geosphere - Biosphere Programme
IMBER	Integrated Marine Biogeochemistry and Ecosystem Research
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange
KOICA	Korea International Cooperation Agency
KORDI	Korea Ocean Research and Development Institute
LME	Large Marine Ecosystem
MLTM	Ministry of Land, Transportation and Marine Affairs
MOMSEI	Monsoon Onset Monitoring over Andaman Sea and its Social and Ecosystem Impacts
MRET	Marine Renewable Energy Technology Development
NEARGOOS	North East Asian Regional GOOS
NMDIS	National Marine Data and Information Service, China
NMEFC	National Marine Environment Forecasting Centre
NOWPAP	North-West Pacific Action Plan
OCD	Ocean Dynamics and Climate
ODIN	Ocean Data and Information Network
ODINWESTPAC	Ocean Data and Information Network for the Western Pacific Region
ODP	Ocean Data Portal
OFD	Ocean Forecasting Demonstration
OFDS	Ocean Forecasting Demonstration System
PICES	North Pacific Marine Science Organization
RMIC	Regional Marine Instrument Centre
RORP	Regional Ocean Research Priority Plan
ROSCOP	Report of Observations/Samples Collected by Oceanographic Programmes
SCOR	Scientific Committee on Oceanic Research
SEAGOOS	South East Asian Global Observing System
SOA	State Ocean Administration, China
SPREP	Secretariat of the Pacific Regional Environment Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WESTPAC	IOC Sub-Commission for the Western Pacific (WESTPAC)
WMO	World Meteorological Organization

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 <i>ad hoc</i> 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
8. Eighteenth Session of the Executive Council	E, F, S, R, Ar
9. Thirteenth Session of the Assembly	E, F, S, R, Ar
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
17. Twentieth Session of the Executive Council, Paris, 1987	E, F, S, R, Ar
18. Fourteenth Session of the Assembly, Paris, 1987	E, F, S, R, Ar
19. Fifth Session of the IOC Regional Committee for the Southern Ocean	E, F, S, R
20. Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987	E, F, S, R
21. Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Arusha, 1987	E, F
22. Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987	E only
23. Twenty-first Session of the Executive Council, Paris, 1988	E, F, S, R
24. Twenty-second Session of the Executive Council, Paris, 1989	E, F, S, R
25. Fifteenth Session of the Assembly, Paris, 1989	E, F, S, R
26. Third Session of the IOC Committee on Ocean Processes and Climate, Paris, 1989	E, F, S, R
27. Twelfth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Novosibirski, 1989	E, F, S, R
28. Third Session of the Sub-Commission for the Caribbean and Adjacent Regions, Caracas, 1989	E, S
29. First Session of the IOC Sub-Commission for the Western Pacific, Hangzhou, 1990	E only
30. Fifth Session of the IOC Regional Committee for the Western Pacific, Hangzhou, 1990	E only
31. Twenty-third Session of the Executive Council, Paris, 1990	E, F, S, R
32. Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, New York, 1990	E only
33. Seventh Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment, Paris, 1991	E, F, S, R
34. Fifth Session of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Paris, 1991	E, F, S, R
35. Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991	E, F, S, R
36. Twenty-fourth Session of the Executive Council, Paris, 1991	E, F, S, R
37. Sixteenth Session of the Assembly, Paris, 1991	E, F, S, R, Ar
38. Thirteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Baja California, 1991	E, F, S, R
39. Second Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1992	E only
40. Twenty-fifth Session of the Executive Council, Paris, 1992	E, F, S, R
41. Fifth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1992	E, F, S, R
42. Second Session of the IOC Regional Committee for the Central Eastern Atlantic, Lagos, 1990	E, F
43. First Session of the Joint IOC-UNEP Intergovernmental Panel for the Global Investigation of Pollution in the Marine Environment, Paris, 1992	E, F, S, R
44. First Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1992	E, F, S
45. Fourteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 1992	E, F, S, R
46. Third Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Vascoas, 1992	E, F
47. Second Session of the IOC Sub-Commission for the Western Pacific, Bangkok, 1993	E only
48. Fourth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Veracruz, 1992	E, S
49. Third Session of the IOC Regional Committee for the Central Eastern Atlantic, Dakar, 1993	E, F
50. First Session of the IOC Committee for the Global Ocean Observing System, Paris, 1993	E, F, S, R
51. Twenty-sixth Session of the Executive Council, Paris, 1993	E, F, S, R
52. Seventeenth Session of the Assembly, Paris, 1993	E, F, S, R
53. Fourteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Tokyo, 1993	E, F, S, R
54. Second Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1993	E, F, S
55. Twenty-seventh Session of the Executive Council, Paris, 1994	E, F, S, R
56. First Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Melbourne, 1994	E, F, S, R
57. Eighth Session of the IOC-UNEP-IMO Committee for the Global Investigation of Pollution in the Marine Environment, San José, Costa Rica, 1994	E, F, S
58. Twenty-eighth Session of the Executive Council, Paris, 1995	E, F, S, R
59. Eighteenth Session of the Assembly, Paris, 1995	E, F, S, R
60. Second Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E, F, S, R

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, Papete, 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	E only
66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	E 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	E 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	E 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	E only
90.	Twenty-first Session of the Assembly, Paris, 2001	E, F, S, R
91.	Thirty-fifth Session of the Executive Council, Paris, 2002	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 (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); and Extraordinary Session, Paris, 20 June 2005	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
110.	First Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Rome, Italy, 21-22 November 2005	E only
111.	Eighth Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Recife, Brazil, 14-17 April 2004 (* Executive Summary available separately in E, F, S & R)	E*
112.	First Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (ICG/CARIBE-EWS), Bridgetown, Barbados, 10-12 January 2006	E only
113.	Ninth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Cartagena de Indias, Colombia, 19-22 April 2006 (* Executive Summary available separately in E, F, S & R)	E S*

114.	Second Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Hyderabad, India, 14–16 December 2005	E only
115.	Second Session of the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology, Halifax, Canada, 19–27 September 2005 (Abridged final report with resolutions and recommendations)	E, F, R, S
116.	Sixth Session of the IOC Regional Committee for the Western Indian Ocean (IOCWIO), Maputo, Mozambique, 2–4 November 2005 (* Executive Summary available separately in E, F, S & R)	E*
117.	Fourth Session of the IOC Regional Committee for the Central Indian Ocean, Colombo, Sri Lanka 8–10 December 2005 (* Executive Summary available separately in E, F, S & R)	E*
118.	Thirty-eighth Session of the Executive Council, Paris, 20 June 2005 (Electronic copy only)	E, F, R, S
119.	Thirty-ninth Session of the Executive Council, Paris, 21–28 June 2006	E, F, R, S
120.	Third Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Bali, Indonesia, 31 July–2 August 2006 (*Executive Summary available separately in E,F,S & R)	E*
121.	Second Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Nice, France, 22–24 May 2006	E only
122.	Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 16–18 March 2005 (* Executive Summary available separately in E, F, S & R)	E*
123.	Fourth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-IV), Mombasa, Kenya, 30 February-2 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
124.	Nineteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Trieste, Italy, 12–16 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
125.	Third Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Bonn, Germany, 7–9 February 2007 (* Executive Summary available separately in E, F, S & R)	E*
126.	Second Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Cumaná, Venezuela, 15–19 January 2007 (* Executive Summary available separately in E, F, S & R)	E*
127.	Twenty-first Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Melbourne, Australia, 3–5 May 2006 (* Executive Summary available separately in E, F, S & R)	E*
128.	Twenty-fourth Session of the Assembly, Paris, 19–28 June 2007	E, F, S, R
129.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Lisbon, Portugal, 21–23 November 2007 (* Executive Summary available separately in E, F, S & R)	E*
130.	Twenty-second Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Guayaquil, Ecuador, 17–21 September 2007 (* Executive Summary available in E, F, S & R included)	E*
131.	Forty-first Session of the Executive Council, Paris, 24 June–1 July 2008	E, F, R, S
132.	Third Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Panama City, Panama, 12–14 March 2008 (* Executive Summary available separately in E, F, S & R)	E*
133.	Eighth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 17–20 April 2007 (* Executive Summary available separately in E, F, S & R)	E*
134.	Twenty-third Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Apia, Samoa, 16–18 February 2009 (*Executive Summary available separately in E, F, S & R)	E*
135.	Twentieth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Beijing, China, 4–8 May 2009 (*Executive Summary available separately in E, F, S & R)	E*
136.	Tenth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Puerto La Cruz, Bolivarian Republic of Venezuela, 22–25 October 2008 (*Executive Summary available separately in E, F, S & R)	E, S*
137.	Seventh Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26–29 May 2008 (*Executive Summary available separately in E, F, S & R)	E*
138.	Ninth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, France, 10–12 June 2009 (* Executive Summary available separately in E, F, S & R);	E*
139.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Athens, Greece, 3–5 November 2008 (* Executive Summary available separately in E, F, S & R)	E*
140.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Fort-de-France, Martinique, France, 2–4 June 2009 (* Executive Summary available separately in E, F, S & R)	E*
141.	Twenty-fifth Session of the Assembly, Paris, 16–25 June 2009	E, F, R, S
142.	Third Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology, Marrakesh, Morocco, 4–11 November 2009	E, F, R, S
143.	Ninth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 22–24 April 2009 (* Executive Summary available separately in E, F, S & R)	E*
144.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Managua, Nicaragua, 15–17 March 2010 (* Executive Summary available in E, F, S & R)	E*
145.	Sixth Session of the IOC Regional Committee for the Central and Eastern Atlantic Ocean, Accra, Ghana, 28–30 March 2010 (* Executive Summary available in E, F, S & R)	E*
146.	Forty-second Session of the Executive Council; Paris, 15, 19 & 20 June 2009	E, F, R, S
147.	Forty-third Session of the Executive Council; Paris, 8–16 June 2010	E, F, R, S
148.	Sixth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Istanbul, Turkey, 11–13 November 2009 (* Executive Summary available separately in Ar, E, F, S & R)	E*
149.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Paris, France, 23–25 November 2010 (* Executive Summary available separately in Ar, E, F, S & R)	E*
150.	Sixth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Santo Domingo, Dominican Republic, 26–29 April 2011 (* Executive Summary available in E, F, S & R)	E*

151.	Twenty-fourth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Beijing, China, 24–27 May 2011 (*Executive Summary in E, F, S & R included)	E*
152.	Twenty-first Session of the IOC Committee on International Oceanographic Data and Information Exchange, Liège, Belgium, 23–26 March 2011 (*Executive Summary available separately in E, F, S & R)	E*
153.	Eighth Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VIII), Bali, Indonesia, 10–13 May 2010 (*Executive Summary available separately in E, F, S & R)	E*
154.	Tenth IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 12–14 April 2011 (* Executive Summary available separately in E, F, S & R)	E*
155.	Forty-fifth Session of the Executive Council, Paris, 26–28 June 2012 (* Decisions available in E, F, S & R)	E*
156.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Willemstad, Curacao, 2–4 April 2012 (*Executive Summary available in E, F, S & R)	E*
157.	Eleventh Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Miami, USA, 17–20 May 2011 (*Executive Summary available separately in E & S)	E, S*
158.	Eight Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-VIII), Trinidad & Tobago, 29 April–1 May 2013 (*Executive Summary available in E, F, S & R)	E*
159.	Twenty-seventh Session of the Assembly, Paris, 26 June–5 July 2013 and Forty-sixth Session of the Executive Council, Paris, 25 June 2013	E, F, R, S
160.	Twenty-fifth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS), Vladivostok, Russian Federation, 9–11 September 2013 (*Executive Summary in E, F & R)	E*
161.	Ninth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, US Virgin Islands, 13-15 May 2014 (*Executive Summary available in E, F, S & R)	E*
162.	Forty-seventh Session of the Executive Council, Paris, 1–4 July 2014 (* Decisions available in E, F, S & R)	E*
163.	Ninth Session of the IOC Sub-Commission of the Western Pacific (WESTPAC-IX), Busan, Republic of Korea, 9–12 May 2012	E