



# **PTWS WORKING GROUP 2 ON DETECTION, WARNING AND DISSEMINATION**

## **Task Team on PacWave11**

Honolulu, United States of America  
21 May 2012

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IOC/PTWS-WG2/TT-PACWAVE11/3  
Honolulu, United States of America  
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## 1. WELCOME, INTRODUCTION AND LOGISTICS

The Chairs, Ms Laura Kong from the [International Tsunami Information Centre](#) (ITIC) and Ms Jo Guard from the [Ministry of Civil Defence & Emergency Management](#) (MCDEM) of New Zealand, opened the meeting of PTWS Working Group 2 Task Team on PacWave11.

Mr Edward Young, Deputy Director of the Pacific Region at the National Weather Service (NWS) of the [National Oceanic Atmospheric Administration](#) (NOAA), welcomed participants from all around the Pacific. He noted the challenges of funding and resources this year, and especially encouraged everyone to come together to collectively accomplish the goals of the Pacific Tsunami Warning and Mitigation System (PTWS).

Mr Brian Yanagi from ITIC provided local meeting room logistics. This was followed by self-introductions by Task Team Members and Observers.

## 2. STRUCTURE AND GOALS OF THE MEETING

Ms Laura Kong provided an introduction to the meeting. The results and outcomes of the Exercise Pacific Wave11 ([IOC/2011/TS/97VOL.1](#) and [IOC/2013/TS/97VOL.2](#)) will be reviewed according to the exercise objectives. Task Team on PacWave11 will summarize the feedback on the [Pacific Tsunami Warning Center](#) (PTWC) new products and provide them to the PTWS Working Group 2 Task Team on Enhancing Products for their action. The findings of PacWave13 ([IOC/2013/TS/106VOL.1.](#)) will be used as input for planning the next PacWave exercise.

## 3. TASK TEAM MEMBERSHIP

Mr Tony Elliott from the [Intergovernmental Oceanographic Commission](#) (IOC) of United Nations Educational, Scientific and Cultural Organization ([UNESCO](#)) reviewed the Task Team (TT) membership and Terms of Reference (ToRs). Currently, there are six official members: Ms Jo Guard, Ms Laura Kong, Mr David Coetzee, Mr Ken Gledhill, Mr Takeshi Koizumi, and Mr Brian Yanagi. Ms Laura Kong noted that the ICG/PTWS Meeting of Working Group 2 Detection, Warning, and Dissemination ([IOC Technical Series 86](#), under preparation) held in Wellington, New Zealand, from 28 February to 4 March, was participated by many persons, but they were not official members.

Mr Tony Elliott stated the rules of Task Team membership, highlighting that members need to be nominated formally. Email nominations are sufficient, and in addition, a curriculum vitae (CV) or biography should accompany the nomination. The Chairs urged interested non-TT members to obtain the nomination of their Tsunami National Contacts (TNC).

The Terms of Reference (ToRs) of Task Team on PacWave11 also do not include the organization of the next PacWave exercise, whereas a PacWave 2012 or 2013 exercise was approved by the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System at its Twenty-fourth Session ([ICG/PTWS-XXIV/3](#)) held in Beijing, China, from 24 to 27 May 2011. In order to conduct the next PacWave exercise before the Twenty-fifth Session of the Intergovernmental Coordination Group for the Pacific Ocean Tsunami Warning and Mitigation System ([ICG/PTWS-XXV](#)) that will be held in Vladivostok, Russian Federation, from 11 to 13 September 2013; the existing Task Team on PacWave11 should continue, with modified Terms of Reference that the PTWS Steering Committee should approve on behalf of Member States.

#### **4. PACWAVE11 SUMMARY**

Ms Laura Kong summarized tsunami events since 2004, noting that most events have occurred in the Pacific and culminating with the 11 March 2011 tsunami in Japan. Because of the size of the Pacific Ocean, the PTWS has several Sub-Regional Working Groups (WGs) on Tsunami Warning and Mitigation to focus on the South East Pacific Region, Central America Pacific Coast, South West Pacific Region, and South China Sea. With the decision of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System ([ICG/PTWS-XXIV/3](#)) at its Twenty-fourth Session that was held in Beijing, China, from 24 to 27 May 2011, the PTWS will be embarking on a major change in the way tsunami warning advice is provided by the PTWC. PTWC will no longer be issuing warnings and watches, and instead will issue forecast products that countries can use to enable national decision-making on warnings for their country.

She reviewed the history of exercises PacWave since 2006, and provided a rationale for the PacWave11 exercise scenarios. She noted that there should have been an exercise in 2010, but the event occurred on 30 September 2009 at Samoa and Tonga resulted in postponement. At the second meeting of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) Steering Committee held at Honolulu, Hawaii, United States of America, from 17 to 20 August 2010 ([PTWS-SC-2](#)), it was recommended to hold the exercise in 2011, and to focus on response to a regional and local tsunami. The Exercise Pacific Wave 11 was also used to introduce the new enhanced warning products proposed by PTWC to countries. For PacWave11, 35 of the 46 Pacific countries participated.

Mr David Coetzee acknowledged the effort that went into developing the 10 scenarios, but noted that in spite of this, the number of participating countries has decreased from 42 in 2006, to 39 in 2008 and 35 in 2011. He asked whether the reason was because the evaluation was too big or hard for countries to complete.

Ms Laura Kong reviewed the preparation for the exercise, noting that time schedules for notice and preparation were generally on schedule.

Lessons learned from Exercise Pacific Wave 08 (IOC Technical Series, 82, [IOC/2008/TS/82](#)) included that the questionnaire had a lot of variation in response and that it was therefore difficult to assess. The PacWave11 questionnaire sought to make it simpler by implementing a 'Yes/No' format. This made it simpler, but increased the number of questions to 99, which may have been too many. In retrospect, ITIC also found some limitation of the survey tool software used (Survey Monkey); these will be addressed and improved for PacWave13.

Ms Jo Guard noted that all documents were electronic and online, saving costs. The preparation time was long, almost 8 months of intensive effort led by ITIC and MCDEM of New Zealand. Yet, every country did not, or could not, participate, despite numerous reminders. In some cases, other emergencies caused exercise plans to be cancelled, and for other countries, there still remains some work to more actively engage countries to encourage their country to take proactive efforts to mitigate tsunamis.

It was also noted that it took multiple reminders to countries to send back the post-exercise evaluation questionnaire. One concern was that the amount of time allowed (3 months) was too long, so that the priority in some countries was lost with time. It was suggested the evaluation time should be shortened for PacWave13.

## 5. PACWAVE11 ASSESSMENT QUESTIONNAIRE SUMMARY

The post-exercise questionnaire was available as an online survey, as well as an offline survey. Countries were encouraged to complete the questionnaire through the online tool. The questionnaire was available in English and Spanish, and consisted of 99 questions covering each of the exercise objectives.

### 5.1 OVERALL FINDINGS

The following are the preliminary overall findings from Exercise Pacific Wave 11.

Positive findings included the following:

- The overall assessment was that PacWave11 had been well organized and that the planning, conduct and style at all levels had been satisfactory. External relationships of country stakeholders had been enhanced.
- The exercise documentation was found to be appropriate and easy to use. 100% of the respondents thought the guideline *How to plan, conduct and evaluate UNESCO/IOC tsunami wave exercises* (IOC Manuals and Guides, 58, [IOC/2012/MG/58 Rev](#)) as useful.
- The evaluation form was found easy to use but it was noted that there were too many questions. The time period between the exercise and the return of the evaluation forms was too long and “Survey Monkey” may need to be upgraded to more effectively manipulate the data. A contractor will be employed to process the data and prepare the final report.
- The feedback received on the PTWC experimental products was positive. The PTWC experimental products were found to be generally understood and useful. However, a more informative user guide is still required. The most useful features were: the threat level map, the inclusion of wave heights, travel and arrival times, and forecast amplitudes. Many suggestions for improvement of the PTWC experimental products were received and these will be passed to PTWC and PTWS WG 2 Task Team on Enhancing Products for review and assessment of feasibility and implementation.

Areas identified that will require improvement included:

- Notification was received by most National Tsunami Warning Centres (NTWCs) & National Disaster Management Offices (NDMOs) within 15–20 minutes, which may not be quick enough in a local tsunami;
- Majority of NTWCs received messages by fax and email, which may be subject to failure in a local earthquake;
- Over 50% of the agencies reported not having evacuation signage and requested assistance in scheduling exercises. Further assistance in developing Standard Operating Procedures (SOPs) is also required.

For the next Exercise Pacific Wave in 2013, it will be necessary to decide the objective and on the level of exercise, noting that fully functional exercises require significant national and local planning, and preparation time. Owing to the priority of the PTWS to fully prepare countries for the introduction of the new PTWC products, the Task Team recommended that PacWave13 concentrate on the new products, and that the objective be to validate only the new products, rather than the entire system.

With regard to each Objective, the following are observations to the different questions:

Objective 1 To exercise and evaluate operations of the current PTWS

It was reported that 26% of the participating countries chose the Philippines Trench Pacific Ocean scenario.

On the receipt of bulletins by the Tsunami Warning Focal Point (TWFP), the following observations were compiled:

- Some Pacific Island Countries thought they had an option of running it on 9 or 10 November. There may have been confusion because of International Date Line
- Eighty-nine (89%) per cent received the initial start message. However, some countries were expecting the bulletins to be issued in real time. Only an exercise start bulletin was issued.
- Japan Meteorological Agency (JMA) experienced some countries fax not delivered. This appears to be a fax number problem. There were transmission failures for some countries, with some resent up to two times.
- Some countries use personal numbers/email (not institutional).
- PTWC reported the high FAX cost it incurs when issuing bulletins, and asked if all FAX numbers are needed. If possible, PTWC requested a limit to the number of fax numbers per NTWC to perhaps two.
- IOC continues to be unsuccessful in obtaining official TWFP information through formal channels. It was noted by ITIC that they often receive updated information informally; when received ITIC acknowledges and provides information to PTWC and IOC (who can then follow up).
- It was noted that some countries depend on the RANET SMS as the 1st alert, but also that the service does not work in some places (reason unknown). It was re-emphasized that the RANET service is not considered being an official operational communications method, and as such, it is not guaranteed to be timely though some countries may be expecting it to be.
- On the arrival of the exercise start message; there was variation in reporting the time of receipt. In addition, it appears that there was misinterpretation of Q1a, as countries answered this question but it was intended for only the international warning centres.

Other findings were:

- Ninety-two (92%) per cent used their country SOPs.
- >80% reported that their messages were timely downstream, though some delays reported.
- Nicaragua reported that even though they had a meeting before the exercise to explain details, there were still difficulties in conducting the exercise.
- Some NDMOs get warnings directly from the international Tsunami Warning Centres (TWCs) via EMWIN & did not understand the science language used. The Task Team identified this as an action for each country to address – the NTWC, not NDMO, should be interpreting the forecast products and deciding whether to issue a national warning or not to the NDMO.



Objective 2 To begin a process of exposure to an initial test version of PTWC experimental products that are being developed to provide a more rapid and quantitative forecast of tsunami impacts.

This section asked questions on the PTWC new products. Feedback was generally very positive. Looking at the new features, the PTWS Chair stated that the new products are a big step forward since it will avoid advising all countries of the Pacific Ocean to issue national warnings; he recommended to keep the products simple for the initial implementation, and then to add more features over time. It was recommended that a more detailed PTWC new products users guide is needed.

Useful comments and questions were submitted on colour coding, threat thresholds, additional labelling (grids, latitude/longitude) and on error and uncertainty. There was discussion on whether the threat ranges were appropriate or if an additional higher threat level was needed or useful. Countries provided information on how warnings are issued, and on what criteria are used in their countries; it was noted that some countries rely on PTWC for warnings.

PTWC remarked that the application of Green's Law for small islands would probably result in an overestimate the coastal runup. In general, Green's Law approximations are conservative, but for small islands, it probably will way overestimate in some places.

Comments, discussion, and decisions by the Task Team where possible were:

- Threat thresholds (number of levels). It was decided that an additional threat level for extreme tsunamis was not necessary for the initial implementation.
- Colour palette harmonization is still needed. New Zealand shared its neutral colour scheme.
- Coastal Forecast Zone delineation looks appropriate but some coordination details are still needed. PTWC will review and harmonize, and seek input from affected countries where necessary. One comment suggested it might be useful to have more forecast zones closer to the earthquake source, while possible; this would not be practical because it would require customization and therefore could slow response time.
- Islands are not easily seen on the maps. It was suggested that dots be added for islands in threat zones in order for them to be seen easily.
- Provide guidance and listing of key sea level gauges that are diagnostic for destructive tsunamis. This would help countries with little capacity. This would be difficult to do during an event; rather, countries are recommended to conduct their own sensitivity analysis for different sources prior, and/or this topic could be covered as part of any requested new products training.
- Include tsunami arrival times (PTWC uses TTT software algorithm). It is expected that these will be in the text product, as they are in the existing products. A table on a web site or by email could provide even more detail. The Group thought that reporting of multiple arrival times (as done in the IOTWS [T1, T2, T3, T4]) was not required and it was noted that multiple values might cause confusion.
- Include historical events on graphical products. This could be useful, but may clutter the primary forecast information. A solution would be to use the Google Earth viewer to add a historical event layer atop the forecast kmz file. A kmz layer of historical tsunamis can be downloaded from the NOAA NGDC.

- Information and guidance on expected secondary waves, and/or reflected waves. This is not currently possible.
- Error bar or forecast value uncertainty, especially for values that predict damage (and would result in national warnings). This is not possible in the products, but a discussion will be included in users guide.
- Addition of seismic moment and CMT solution in products. It was considered as useful, but this would be implemented in a later version of the products.
- Forecast for both initial height of waves and number of waves. It is not possible, nor reliable, at this time.
- Reporting times. It was decided that bulletins would continue to only be in UTC (Zulu) time.
- It was noted that Australia requested to be excluded from the new products. PTWC will contact Australia PTWS Tsunami National Contact (Mr Ray Canterford, or Mr Chris Ryan, JATWC Director,) to informally clarify the issues and how it will be solved. If Australia does want to decline participation to receive the products, this should be done formally to the IOC PTWS Secretariat as the IOC PTWC service is intended to provide alerts for all countries of the Pacific.

Objective 3 To validate the readiness of Member States to respond to a local/regional source tsunami.

Answers to questions were overwhelmingly Yes, suggesting countries believe they have a high level of preparedness.

Summaries are the following:

- Only 51% had mass evacuation plans.
- Routine regional/local tsunami exercises only conducted by 50%.
- Tsunami-related curriculum programmes and community evacuation maps are relatively low at 9%.
- Discussion about using commercial email services for sending messages downstream from NTWC. What if it goes down?
- Communications problems were most often identified as the reason the exercise did not go well.

There was general discussion on the most effective way to follow up on the findings of PacWave11. The Chair of PTWS Working Group 3 on Awareness and Response suggested that the Regional and Technical WGs should be a focal point for region-specific recommendations. A response could be to conduct a regional training on unmet needs and gaps.

ITIC and MCDEM commented that the post-exercise questionnaire provided a lot of valuable information on the state of readiness of countries. However, much time-consuming work remained to collate and extract the commonalities from the data. In response, the Tsunami National Contact (TNC) of New Zealand offered to support a contractor to do the analysis.

The Task Team decided to compile fully the Summary Report with the support of a contractor. However, because of the large volume of post-exercise information collected, the report should be considered to be published only in hard-copy format. The Executive Summary should provide the overall findings, conclusions, and recommendations.

The ICG/PTWS Chair emphasized the importance of adopting a sustainable exercise programme. He also requested to devise metrics to better measure performance. Distant sources have been done, but local sources are still very difficult.

The feedback gathered on the new products during PacWave11 will be forwarded to the PTWS WG 2 Task Team on Enhancing Products and discussed further. Recommendations will be brought to the Steering Committee for final decision-making.

## RECOMMENDATIONS TO PTWS STEERING COMMITTEE

### Exercise Pacific Wave 13

The Task Team discussed the next tsunami exercise, specifically the dates, objectives, scenarios, and required training for the Exercise Pacific Wave 13, as well as the Task Team Terms of Reference and Task Team Membership.

It was noted that the ICG/PTWS meets only every two years, with the next Intergovernmental Coordination Group (ICG) to be hosted in Vladivostok, Russian Federation, from 11 to 13 September 2013. It was agreed that it is a high-priority to approve the PTWC new products at this meeting. However, Japan noted that PacWave11 did not introduce the new PTWC text products and so another exercise will be important to introduce these, as well as to use PacWave11 requested improvements to the PTWC graphical products. It was suggested that a tabletop exercise would be sufficient. Additionally, the existing evaluation form questions relating to the experimental products could again be used, supplemented with additional specific questions based on the observations from PacWave11. It was agreed that a smaller number of scenarios would be acceptable, and countries could exercise either a distant or a local/regional source.

The Task Team agreed that there should be a 2013 exercise where new products should be exercised. This would allow informed input for decision-making for approving the PTWC new products and their date of changeover to the new products at the Twenty-fifth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXV). The PTWC Steering Committee should review the results of PacWave13 before the next ICG. The goal continues to be for an official changeover at the beginning of 2014.

### PacWave13 Task Team

On the planning and coordination of Exercise Pacific Wave 13, the Task Team recommended to continue the PacWave11 Task Team as the most sensible action, with Terms of Reference modified to 2013 exercise objectives.

On the Task Team Membership, the Task Team welcomed new members. Interested Member States should officially communicate their nominations, sending their CV to the IOC.

## **6. REVISED PTWC NEW PRODUCTS IMPLEMENTATION TIMETABLE**

Based on this discussion, Laura Kong from ITIC proposed, and the Task Team agreed, on a revised timeline for implementation of the PTWC new products:

- PTWC starts issuing new products, in parallel with existing: 1 February 2013;
- Countries conduct PacWave13 as a tabletop exercise: April 2013;

- Countries fill out PacWave13 evaluation forms and return it by: 30 April 2013;
- Task Team evaluates PacWave13 and provide summary Report by: 31 May 2013;
- Steering Committee reviews/approves products just prior to next ICG: 11 September 2013.

These recommendations will be considered for approval by the PTWS Steering Committee.

## **7. CLOSING**

The Chairs thanked the Task Team Members and Observers ([Annex II](#)) for their participation. Feedback on PTWC new products will be forwarded for discussion and action to the PTWS Working Group 2 Task Team on Enhancing Products met in Honolulu, United States of America, the 22 and 23 May 2012. The PTWS Steering Committee will meet on 24 and 25 May 2013 to approve Task Team recommendations.

ANNEX I

**AGENDA**

TIME	TOPIC	SPEAKER/LEADER
9:00 AM	Welcoming remarks, NWS pacific region	Ed Young Deputy Director
9.05 AM	Introduction, logistics	Laura Kong Brian Yanagi
9.15 AM	Structure and goals of meeting PacWave11 Task Team membership	Laura Kong Tony Elliott
9:30 AM	PacWave11 summary	Laura Kong
10:00 AM	Coffee break	
10:30 AM	PacWave11 evaluation: questionnaire results and findings, lessons learned, gaps, recommendations	Jo Guard David Coetzee
12:00 PM	Lunch break	
1:30 PM	PacWave11 evaluation (continued)	Jo Guard David Coetzee
3:00 PM	Coffee break	
3:30 PM	Recommendations to steering committee next PacWave exercise planning (dates, objective, scenarios, training) PacWave13 task team membership and Terms of Reference	Laura Kong Jo Guard
4:00	Adjourn	

ANNEX II

**LIST OF PARTICIPANTS**

PARTICIPANTS

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ANNEX III

**LIST OF ACRONYMS**

<b>EMWIN</b>	Emergency Managers Weather Information Network
<b>ICG</b>	Intergovernmental Coordination Group
<b>ICG/PTWS</b>	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>ITIC</b>	International Tsunami Information Centre
<b>JATWC</b>	Joint Australian Tsunami Warning Centre
<b>JMA</b>	Japan Meteorological Agency
<b>MCDEM</b>	Ministry of Civil Defence & Emergency Management
<b>NDMO</b>	National Disaster Management Office
<b>NOAA</b>	National Oceanic Atmospheric Administration
<b>NTWC</b>	National Tsunami Warning Centre
<b>NWS</b>	National Weather Service
<b>PTWC</b>	Pacific Tsunami Warning Center
<b>PTWS</b>	Pacific Tsunami Warning and Mitigation System
<b>RANET</b>	Response and Assistance Network
<b>SOP</b>	Standard Operating Procedure
<b>TNC</b>	Tsunami National Contacts
<b>ToR</b>	Terms of Reference
<b>TT</b>	Task Team
<b>TWC</b>	Tsunami Warning Centre
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WG</b>	Working Group



In this Series, entitled

**Reports of Meetings of Experts and Equivalent Bodies**, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued:

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans S. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' (**Also printed in Spanish**)
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
11. First Session of the IOC Consultative Group on Ocean Mapping (**Also printed in French and Spanish**)
12. Joint 100-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica (**Spanish only**)
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (**Also printed in French and Spanish**)
25. Third Session of the IOC Group of Experts on Effects of Pollutants
26. Eighth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
27. Eleventh Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (**Also printed in French**)
28. Second Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
29. First Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities (**Also printed in Spanish**)
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System
34. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
35. Fourth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
36. First Consultative Meeting on RNODCs and Climate Data Services
37. Second Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow
38. Fourth Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
39. Fourth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
40. Fourteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
41. Third Session of the IOC Consultative Group on Ocean Mapping
42. Sixth Session of the Joint IOC-WMO-CCPS Working Group on the Investigations of 'El Niño' (**Also printed in Spanish**)
43. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
44. Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
45. Ninth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
46. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
47. Cancelled
48. Twelfth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
49. Fifteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
50. Third Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
51. First Session of the IOC Group of Experts on the Global Sea-Level Observing System
52. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean
53. First Session of the IOC Editorial Board for the International Chart of the Central Eastern Atlantic (**Also printed in French**)
54. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (**Also printed in Spanish**)
55. Fifth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
56. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
57. First Meeting of the IOC *ad hoc* Group of Experts on Ocean Mapping in the WESTPAC Area
58. Fourth Session of the IOC Consultative Group on Ocean Mapping
59. Second Session of the IOC-WMO/IGOSS Group of Experts on Operations and Technical Applications

60. Second Session of the IOC Group of Experts on the Global Sea-Level Observing System
61. UNEP-IOC-WMO Meeting of Experts on Long-Term Global Monitoring System of Coastal and Near-Shore Phenomena Related to Climate Change
62. Third Session of the IOC-FAO Group of Experts on the Programme of Ocean Science in Relation to Living Resources
63. Second Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
64. Joint Meeting of the Group of Experts on Pollutants and the Group of Experts on Methods, Standards and Inter-calibration
65. First Meeting of the Working Group on Oceanographic Co-operation in the ROPME Sea Area
66. Fifth Session of the Editorial Board for the International Bathymetric and its Geological/Geophysical Series
67. Thirteenth Session of the IOC-IHO Joint Guiding Committee for the General Bathymetric Chart of the Oceans **(Also printed in French)**
68. International Meeting of Scientific and Technical Experts on Climate Change and Oceans
69. UNEP-IOC-WMO-IUCN Meeting of Experts on a Long-Term Global Monitoring System
70. Fourth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
71. ROPME-IOC Meeting of the Steering Committee on Oceanographic Co-operation in the ROPME Sea Area
72. Seventh Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' **(Spanish only)**
73. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico **(Also printed in Spanish)**
74. UNEP-IOC-ASPEI Global Task Team on the Implications of Climate Change on Coral Reefs
75. Third Session of the IODE Group of Experts on Marine Information Management
76. Fifth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
77. ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area
78. Third Session of the IOC Group of Experts on the Global Sea-level Observing System
79. Third Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
80. Fourteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
81. Fifth Joint IOG-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
82. Second Meeting of the UNEP-IOC-ASPEI Global Task Team on the Implications of climate Change on Coral Reefs
83. Seventh Session of the JSC Ocean Observing System Development Panel
84. Fourth Session of the IODE Group of Experts on Marine Information Management
85. Sixth Session of the IOC Editorial Board for the International Bathymetric chart of the Mediterranean and its Geological/Geophysical Series
86. Fourth Session of the Joint IOC-JGOFS Panel on Carbon Dioxide
87. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Pacific
88. Eighth Session of the JSC Ocean Observing System Development Panel
89. Ninth Session of the JSC Ocean Observing System Development Panel
90. Sixth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
91. First Session of the IOC-FAO Group of Experts on OSLR for the IOCINCWIO Region
92. Fifth Session of the Joint IOC-JGOFS CO<sub>2</sub> Advisory Panel Meeting
93. Tenth Session of the JSC Ocean Observing System Development Panel
94. First Session of the Joint CMM-IGOSS-IODE Sub-group on Ocean Satellites and Remote Sensing
95. Third Session of the IOC Editorial Board for the International Chart of the Western Indian Ocean
96. Fourth Session of the IOC Group of Experts on the Global Sea Level Observing System
97. Joint Meeting of GEMSI and GEEP Core Groups
98. First Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
99. Second International Meeting of Scientific and Technical Experts on Climate Change and the Oceans
100. First Meeting of the Officers of the Editorial Board for the International Bathymetric Chart of the Western Pacific
101. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
102. Second Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
103. Fifteenth Session of the Joint IOC-IHO Committee for the General Bathymetric Chart of the Oceans
104. Fifth Session of the IOC Consultative Group on Ocean Mapping
105. Fifth Session of the IODE Group of Experts on Marine Information Management
106. IOC-NOAA *Ad hoc* Consultation on Marine Biodiversity
107. Sixth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
108. Third Session of the Health of the Oceans (HOTO) Panel of the Joint Scientific and Technical Committee for GLOSS
109. Second Session of the Strategy Subcommittee (SSC) of the IOC-WMO-UNEP Intergovernmental Committee for the Global Ocean Observing System
110. Third Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
111. First Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate
112. Sixth Session of the Joint IOC-JGOFS CO<sub>2</sub> Advisory Panel Meeting
113. First Meeting of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS)
114. Eighth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño" **(Spanish only)**
115. Second Session of the IOC Editorial Board of the International Bathymetric Chart of the Central Eastern Atlantic **(Also printed in French)**
116. Tenth Session of the Officers Committee for the Joint IOC-IHO General Bathymetric Chart of the Oceans (GEBCO), USA, 1996
117. IOC Group of Experts on the Global Sea Level Observing System (GLOSS), Fifth Session, USA, 1997
118. Joint Scientific Technical Committee for Global Ocean Observing System (J-GOOS), Fourth Session, USA, 1997
119. First Session of the Joint 100-WMO IGOSS Ship-of-Opportunity Programme Implementation Panel, South Africa, 1997
120. Report of Ocean Climate Time-Series Workshop, Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate, USA, 1997
121. IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS), Second Session, Thailand, 1997

122. First Session of the IOC-IUCN-NOAA *Ad hoc* Consultative Meeting on Large Marine Ecosystems (LME), France, 1997
123. Second Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), South Africa, 1997
124. Sixth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico, Colombia, 1996  
(**also printed in Spanish**)
125. Seventh Session of the IODE Group of Experts on Technical Aspects of Data Exchange, Ireland, 1997
126. IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), First Session, France, 1997
127. Second Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 1998
128. Sixth Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1997
129. Sixth Session of the Tropical Atmosphere - Ocean Array (TAO) Implementation Panel, United Kingdom, 1997
130. First Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 1998
131. Fourth Session of the Health of the Oceans (HOTO) Panel of the Global Ocean Observing System (GOOS), Singapore, 1997
132. Sixteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), United Kingdom, 1997
133. First Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1998
134. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IOC/EB-IBCWIO-IW3), South Africa, 1997
135. Third Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), France, 1998
136. Seventh Session of the Joint IOC-JGOFS CO2 Advisory Panel Meeting, Germany, 1997
137. Implementation of Global Ocean Observations for GOOS/GCOS, First Session, Australia, 1998
138. Implementation of Global Ocean Observations for GOOS/GCOS, Second Session, France, 1998
139. Second Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Brazil, 1998
140. Third Session of IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), China, 1998
141. Ninth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Ecuador, 1998 (**Spanish only**)
142. Seventh Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Croatia, 1998
143. Seventh Session of the Tropical Atmosphere-Ocean Array (TAO) Implementation Panel, Abidjan, Côte d'Ivoire, 1998
144. Sixth Session of the IODE Group of Experts on Marine Information Management (GEMIM), USA, 1999
145. Second Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), China, 1999
146. Third Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Ghana, 1999
147. Fourth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC); Fourth Session of the WCRP CLIVAR Upper Ocean Panel (UOP); Special Joint Session of OOPC and UOP, USA, 1999
148. Second Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1999
149. Eighth Session of the Joint IOC-JGOFS CO2 Advisory Panel Meeting, Japan, 1999
150. Fourth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Japan, 1999
151. Seventh Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1999
152. Sixth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 1999
153. Seventeenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), Canada, 1999
154. Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y el Golfo de Mexico (IBCCA), Septima Reunión, Mexico, 1998  
IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA), Seventh Session, Mexico, 1998
155. Initial Global Ocean Observing System (GOOS) Commitments Meeting, IOC-WMO-UNEP-ICSU/Impl-III/3, France, 1999
156. First Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Venezuela, 1999 (**also printed in Spanish and French**)
157. Fourth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), China, 1999
158. Eighth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Russian Federation, 1999
159. Third Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), Chile, 1999
160. Fourth Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS). Hawaii, 2000
161. Eighth Session of the IODE Group of Experts on Technical Aspects of Data Exchange, USA, 2000
162. Third Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 2000
163. Fifth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Poland, 2000
164. Third Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 2000
165. Second Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Cuba, 2000 (**also printed in Spanish and French**)
166. First Session of the Coastal Ocean Observations Panel, Costa Rica, 2000
167. First GOOS Users' Forum, 2000
168. Seventh Session of the Group of Experts on the Global Sea Level Observing System, Honolulu, 2001
169. First Session of the Advisory Body of Experts on the Law of the Sea (ABE-LOS), France, 2001 (**also printed in French**)
170. Fourth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, Chile, 2001
171. First Session of the IOC-SCOR Ocean CO<sub>2</sub> Advisory Panel, France, 2000
172. Fifth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), Norway, 2000 (**electronic copy only**)
173. Third Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, USA, 2001 (**also printed in Spanish and French**)
174. Second Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Italy, 2001
175. Second Session of the Black Sea GOOS Workshop, Georgia, 2001
176. Fifth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2000
177. Second Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Morocco, 2002 (**also printed in French**)
178. Sixth Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), Australia, 2001 (**electronic copy only**)
179. *Cancelled*

180. Second Session of the IOC-SCOR Ocean CO<sub>2</sub> Advisory Panel, Honolulu, Hawaii, U.S.A, 2002 (*electronic copy only*)
181. IOC Workshop on the Establishment of SEAGOOS in the Wider Southeast Asian Region, Seoul, Republic of Korea, 2001 (SEAGOOS preparatory workshop) (*electronic copy only*)
182. First Session of the IODE Steering Group for the Resource Kit, USA, 19–21 March 2001
183. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002
184. Seventh Session of the IODE Group of Experts on Marine Information Management (GEMIM), France, 2002 (*electronic copy only*)
185. Sixth Session of IOC/WESTPAC Coordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2001 (*electronic copy only*)
186. First Session of the Global Ocean Observing System (GOOS) Capacity Building Panel, Switzerland, 2002 (*electronic copy only*)
187. Fourth Session of the ad hoc Advisory Group for IOCARIBE-GOOS, 2002, Mexico (*also printed in French and Spanish*)
188. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO), Mauritius, 2000
189. Third session of the Editorial Board for the International Bathymetric Chart of the Western Pacific, China, 2000
190. Third Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Vietnam, 2002
191. Eighth Session of the IOC Consultative Group on Ocean Mapping, Russian Federation, 2001
192. Third Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Lisbon, 2003 (*also printed in French*)
193. Extraordinary Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Chile, 1999 (*Spanish only; electronic copy only*)
194. Fifth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, France, 2002
195. Sixth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, South Africa, 2003
196. Fourth Session of the Coastal Ocean Observations Panel, South Africa, 2002 (*electronic copy only*)
197. First Session of the JCOMM/IODE Expert Team On Data Management Practices, Belgium, 2003 (*also JCOMM Meeting Report No. 25*)
198. Fifth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2003
199. Ninth Session of the IOC Consultative Group on Ocean Mapping, Monaco, 2003 (*Recommendations in English, French, Russian and Spanish included*)
200. Eighth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 2003 (*electronic copy only*)
201. Fourth Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Greece, 2004 (*also printed in French*)
202. Sixth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2004 (*electronic copy only*)
203. Fifth Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Argentina, 2005 (*also printed in French*)
204. Ninth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 2005 (*electronic copy only*)
205. Eighth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), China, 2003 (*electronic copy only*)
206. Sixth Meeting of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Spain, 2006 (*also printed in French*)
207. Third Session of the Regional Forum of the Global Ocean Observing System, South Africa, 2006 (*electronic copy only*)
208. Seventh Session of the IOC-UNEP-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2005 (*electronic copy only*)
209. Eighth Session of the IOC-UNEP-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2006 (*electronic copy only*)
210. Seventh Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Gabon, 2007 (*bilingual English/French*)
211. First Meeting of the IOC Working Group on the Future of IOC, Paris, 2008 (*Executive Summary in English, French, Russian and Spanish included*)
212. First meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 3–4 April 2008 (*Executive Summary in English, French, Russian and Spanish included*)
213. First Session of the Panel for Integrated Coastal Observation (PICO-I), Paris, 10–11 April 2008 (*electronic copy only*)
214. Tenth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 6–8 June 2007 (*electronic copy only*)
215. Eighth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Paris, 21–25 April 2008 (*bilingual English/French*)
216. Fourth Session of the Global Ocean Observing System (GOOS) Regional Alliances Forum (GRF), Guayaquil, Ecuador, 25–27 November 2008 (*electronic copy only*)
217. Second Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 27 March 2009 (*Executive Summary in English, French, Russian and Spanish included*)
218. Ninth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Paris, 30 March–3 April 2009 (*bilingual English/French*)
219. First Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 3), Broomfield, Colorado, U.S.A., 1 October 2005 (*electronic copy only*)
220. Second Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 6), Paris, France, 20 April 2007 (*electronic copy only*)
221. Third Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 10), Villefranche-sur-mer, France, 3–4 October 2008 (*electronic copy only*)
222. Fourth Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 15), Jena, Germany, 14 September 2009 (*electronic copy only*)
223. First Meeting of the joint IOC-ICES Study Group on Nutrient Standards (SGONS) (also IOCCP Reports, 20), Paris, France, 23–24 March 2010 (*Executive Summary in E, F, R, S included*)
224. Third Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Lisbon, Portugal, 5–6 May 2010 (*Executive Summary in English, French, Russian and Spanish included*)
225. Eleventh Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 13–15 May 2009 (*electronic copy only*)
226. Second Session of the Panel for Integrated Coastal Observation (PICO-II), Paris, 24–26 February 2009 (*electronic copy only*)
227. First meeting of the Task Team on Seismic Data Exchange in the South West Pacific of the ICG/PTWS Regional Working Group for the Southwest Pacific, Port Vila, Vanuatu, 19–20 October 2009 (*electronic copy only*)
228. Fourth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, France, 20–21 March 2011 (*Executive Summary in English, French, Russian and Spanish included*)
229. Second Session of the IODE Steering Group for Ocean Teacher (SG-OT), Miami, Florida, 11–15 April 2011
230. First Meeting of the Inter-ICG Task Team 1 on Sea Level Monitoring for Tsunami (Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010

231. First Meeting of the Inter-ICG Task Team 2 on Disaster Management and Preparedness (Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010
232. First Meeting of the Inter-ICG Task Team 3 on Tsunami Watch Operations (Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010
233. Primera Reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), Managua (Nicaragua) del 4 al 6 de noviembre de 2009 (**Resumen dispositivo en español e inglés**)
234. Segunda Reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), San Salvador (El Salvador) del 28 al 30 de septiembre de 2011 (**Resumen dispositivo en español e inglés**)
235. First Session of the Joint IODE-JCOMM Steering Group for the Global Temperature-Salinity Profile Programme (SG-GTSPP), 16–20 April 2012, Ostend, Belgium
236. Ad hoc Session of the Joint JCOMM-IODE Steering Group for the Ocean Data Standards Pilot Project (SG-ODSPP), 23–25 April 2012, Ostend, Belgium
237. First Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Sanya, China, 12–14 December 2011
238. First Meeting of the IODE Steering Group for OceanDocs (SG-OceanDocs), 24–27 January 2012, Ostend, Belgium
239. Fifth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Tokyo, Japan, 15 February 2012 (**Executive Summary in English, French, Russian and Spanish included**)
240. Ad hoc Session of the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BICH), Ostend, Belgium, 25 October 2012
241. Twelfth Session of the IODE Group of Experts on Marine Information Management (GE-MIM), Miami, USA, 22–25 January 2013
242. Twelfth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 9–11 November 2011 (**electronic copy only**)
243. Meeting of the Pacific Tsunami Warning System Working Group 2 on Detection, Warning and Dissemination Task Team on PacWave11, Honolulu, USA, 21 May 2012 (**electronic copy only**)