

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies



Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions

Second Session

Cumana, Venezuela

12–14 March 2007

UNESCO

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ICG/CARIBE-EWS II/3
Paris, 5 April 2007
Available in English and Spanish*

Abstract:

The Second Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS II), was held in Cumana, Venezuela, 12-14 March 2007. The meeting was attended by nearly 60 participants from 11 countries in the Caribbean Region and three organizations. The ICG reviewed the progress made during the intersessional period, adopted revised Terms of Reference for its four Working Groups and urged Member States to nominate their Tsunami Warning Focal Points (TWFP) and Tsunami National Contact (TNC) by the end of 2007 at the latest. The group planned for two regional workshops for Tsunami Warning Focal Points (TWFP) and one regional Symposium in conjunction with the 10th IOCARIBE Session. The ICG recommended the adoption of the Communications Plan developed for the Caribbean and Adjacent regions by the Pacific Tsunami Warning Center (PTWC) and adopted the Implementation Plan as a tool for establishing and monitoring the CARIBE-EWS. It further agreed to establish an initial core system for detecting and verifying tsunamis with the CARIBE-EWS by the end of 2008 and actively plan to take over the full responsibility for the system with a Caribbean Tsunami Warning Centre in the region at least by 2010.

(SC-2007/WS/24)

* An executive summary of this report (ICG/CARIBE-EWS II/3s) is also available in French, Russian and Spanish on <http://unesdoc.unesco.org>

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1. WELCOME AND OPENING

1 The session was opened on Monday 12 March 2007 under the Chairmanship of Mr Gustavo Malavé, President (E), FUNVISIS —Fundación Venezolana de Investigaciones Sismológicas— and Vice-Chair of ICG/CARIBE-EWS, on behalf of the Chairman who was unable to attend.

2 The Group was welcomed by Dr Ramon Martinez, Governor of the State of Sucre, Bolivarian Republic of Venezuela and by Dr Gladys Maggi, Vice-Minister for Science and Technology, Bolivarian Republic of Venezuela.

3 In his intervention, the Governor of the State of Sucre called for actions to get a Caribbean Tsunami Warning System up and running and offered financial support from the Government of the State of Sucre. As well, he offered the support of the Government of the State of Sucre to develop educational tools for tsunami preparedness. On behalf of the President of Venezuela and of the Government of the Bolivarian Republic of Venezuela he welcomed the participants to the State of Sucre.

4 Dr Gladys Maggi underscored the high level of consensus achieved by stakeholders involved in the development of CARIBE EWS. She commented on the need for production of conceptual and technical knowledge and its transmission and application by local communities to cope with natural hazards. She referred to the proposal put forward by the Government of Venezuela to establish, in cooperation with the Government of Barbados, a Caribbean Tsunami Information Centre (CTIC). She reported that the Government of the Bolivarian Republic of Venezuela decided to task FUNVISIS with organising the contribution of Venezuela to CTIC. She finally reported on the decision of the Venezuelan Government to fund \$ 500,000 to develop a National Tsunami Warning Centre that could also function as a regional centre. With this she declared the meeting officially opened.

5 Dr Patricio Bernal, Assistant Director-General of UNESCO and Executive Secretary of Intergovernmental Oceanographic Commission thanked the Government of the Bolivarian Republic of Venezuela for hosting the Second Session of ICG/CARIBE-EWS and for providing excellent logistic and organisational facilities for the meeting. ADG/IOC transmitted the compliments from Director-General Koichiro Matsuura.

6 He emphasized the vulnerability of poor people to natural hazards and the responsibility for nations to be prepared for and to protect the most vulnerable communities from natural disasters. He reminded that the architecture and the structure of the agreed CARIBE-EWS, which includes the reinforcement of national and local capabilities at the same time of setting the regional network of monitoring and warning delivery. ADG/IOC highlighted the importance of establishing national focal points for receiving and delivering tsunami information and warning.

7 Dr Patricio Bernal referred to the World Bank approved Global Facility for Disaster Reduction and Recovery (GFDRR), as a potential source of financing for developing national and regional capabilities and facilities. He thanked the Ministry for Science and Technology, FUNVISIS, and particularly Dr Gustavo Malavé for his personal involvement in the organisation of this meeting.

8 Dr Gustavo Malavé, on behalf of the Officers of ICG/CARIBE-EWS reported on the status of development of the CARIBE-EWS that, while not satisfactorily enough, is under development and moving in the right direction. He thanked the members and coordinators of

intersessional Working Groups for their involvement and commitment to deliver recommendations to the ICG. He wished all participants a fruitful meeting, thanked the local organising committee and welcomed the participants.

2. ORGANISATION OF THE SESSION

2.1 ADOPTION OF THE AGENDA

9 The Chairman transmitted the excuses of Dr Paul Sanders, ICG Chair, who was unable to attend the session. He presented the preliminary Agenda for the meeting, available as Doc. ICG/CARIBE EWS-II/1 Prov. Rev. 1. Trinidad and Tobago requested the inclusion of an item on format, structure and role of the Tsunami Warning Centre. The Chairman expressed that this item is considered under Item 4.2.

10 The Agenda of the Session as amended is available in Annex I. The List of Participants is available in Annex III.

2.2 DESIGNATION OF RAPPORTEURS

11 The group was requested to consider the need to nominate a Rapporteur for the session. The role of the Rapporteur is to review and certify the report prepared by the Secretariat. The Chairman informed the plenary that as per established practices for subsidiary bodies there is not a line by line approval of the report but only for Decisions and Recommendations. The Chairman stated that the USA proposed Jean Weaver as Rapporteur for English and Venezuela proposed Leonardo Graterol to act as Spanish Rapporteur. **The ICG approved** the proposals and thanked the USA and Venezuela for providing the Rapporteurs.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

12 The Chairman introduced the list of documents, available as Doc. ICG/CARIBE-EWS II/4 Prov. Rev. 1. He informed the plenary that the Communications Plan for the Interim Tsunami Advisory Information Service to the Caribbean Sea and Adjacent Regions (Doc. ICG/CARIBE-EWS II/11) is available only in English. The document on the proposal for a Caribbean Tsunami Information Centre (CTIC) is available in English and will be made available in Spanish during the session.

13 He then introduced the Timetable, available as Doc. ICG/CARIBE-EWS II/1 Prov. Add Rev. 1. The Chairman indicated that nearly all the documents have been made available through the website <http://ioc3.unesco.org/cartws/icg-ii>, both in English and Spanish, with only a limited number of printed copies available for distribution. Printed copies of the report of the First Session of ICG/CARIBE-EWS as well as of the GLOSS Sea Level Manual were distributed to all delegations.

14 The Chairman invited the Plenary to consider the establishment of Sessional Working Groups following the ICG Board recommendations. He proposed setting up five groups: a group to review the terms of reference of intersessional Working Groups, a group to analyse the suggested standards for sea level and seismic monitoring, a group to study budgetary issues, a group to analyse the proposal for a CTIC and a group to review draft recommendations and decisions.

15 **The ICG approved** the establishment of five intrasessional Working Groups with the following Chairmanship:

- 1– Terms of Reference for intersessional ICG Working Groups:
Hernan Perez Nieto, Venezuela
- 2– ICG Seismic and Sea Level monitoring standards:
Lloyd Lynch, Trinidad y Tobago
- 3– Caribbean Tsunami Information Centre :
Lorna Inniss, Barbados
- 4– Budget 2008-2009:
Israel Matos, USA
- 5– Draft Recommendations:
Guillermo García Montero, Cuba

3. REPORT ON INTERSESSIONAL ACTIVITIES

3.1 IOC EXECUTIVE SECRETARY’S REPORT

16 The IOC Executive Secretary reported on the IOC status within the context of the UN Reform process, and the preparation of the UNESCO 34th General Conference, including Programme and Budget matters. He informed the Plenary that the former UN Secretary General Kofi Annan established a High-Level Panel on UN System-wide Conference to explore how the UN system could work more coherently and effectively across the world, including the possibility of creating “more tightly managed entities” in the areas of development, humanitarian assistance and the environment. The Panel presented its recommendations in November 2006 through the document “*Delivering as One. Report of the Secretary-General’s High-Level Panel, United Nations, New York*”.

17 Specifically, the Panel recommended the establishment of One UN at country level, with one leader, one programme, one budget and, where appropriate, one office. As well, the establishment of a number of One UN country pilots (currently Guatemala and Uruguay are being considered as one of these country pilots). The Panel referred to disaster management issues indicating that the UN has a unique and leading role to play in humanitarian disasters and emergencies, that can be further enhanced, among others measures, by “*more investment in risk reduction, early-warning and innovative disaster assistance strategies and mechanisms*”.

18 He also reported on the forthcoming 34th General Conference of UNESCO where the expectations are that there will not be increases in the regular budget available for activities and staff. In the case of the coordination work of IOC for tsunami it is worst to comment that all the costs of this activity is being absorbed through extra budgetary contributions. Finally he summarised the results of the Review Panel for UNESCO’s science programmes which stresses the need for reinforcing intersectoral activities.

19 Venezuela and USA expressed their concerns on the eventual impacts of budgetary restrictions on IOC’s activities on ocean mapping, a key issue for hazard assessment in the Caribbean Sea, particularly for tsunami, storm surges and in general floods and inundations of coastal areas.

3.2 CHAIRMAN’S REPORT

20 The Chairman introduced the activities developed in the intersessional period. He referred to the preparatory meeting held in San Juan, Puerto Rico, 29–30 November 2006, summarised through Doc. ICG/CARIBE-EWS II/10. The Chairman reported that many of the

recommendations suggested at the preparatory meeting have been implemented by the Board and the Secretariat. However, some of the recommendations need previous approval and/or actions from Member States. He emphasised particularly on the need of completing the nomination of the Tsunami Warning Focal Points (TWFP). He mentioned the support received in the intersessional period from IOCARIBE, from the IOC Tsunami Unit and from PTWC and ITIC.

21 Vice-Chairman Israel Matos re-emphasized the need to nominate Focal Points and commented that one possibility might be to nominate in an interim status the representatives to the meeting but charging them with the task of getting the formal nominations from their countries as soon as possible.

3.3 CARIBE-EWS SECRETARIAT REPORT

22 The Technical Secretary (a.i.) for ICG/CARIBE-EWS reported on matters relevant to the establishment and implementation of the system. He informed the Plenary that with support from USAID and PMEL a Community Model Interface for Tsunami (ComMIT) was developed and is available for use in the CARIBE-EWS. In the interim period three meetings of seismic operators in the Caribbean were held and while not specifically in the framework of the CARIBE-EWS these meetings contributed to the development of it. A draft Communications Plan for the CARIBE-EWS was prepared by PTWC and is available for endorsement by the Session. The sea level monitoring component of Working Group 2 met in the intersessional period, analysed the status of the sea level monitoring network for the Caribbean and adjacent region and agreed to further develop the network, including the establishment of 10 representative stations from the region to form the core of the operational baseline system of the Caribbean Sea Level Network. Working Group 3 compared communication systems for rapid warning/alerting and information dissemination and prepared an assessment questionnaire for national capabilities taking stock from the IOC experience in the assessment missions to the Indian Ocean. A special task team worked out a Term of Reference for a Caribbean Tsunami Warning System (CTWC) submitted to this meeting through Doc. ICG/CARIBE-EWS II/9.

23 With respect to the status of nominations of Tsunami Warning Focal Points, he reported that fourteen countries have nominated focal points, namely: Bahamas, Barbados, Belize, Bermuda, Colombia, Costa Rica, Dominican Republic, France (Guadeloupe and Martinique), Grenada, Haiti, Mexico, Netherlands Antilles, St Lucia, and Suriname. He indicated that PTWC is working with a higher number of Focal Points but this is because PTWC is using Focal Points previously nominated to the Pacific Tsunami Warning System (PTWS) in Central America. He finalised his report calling Member States to address the issue of the future of the Secretariat to the ICG/CARIBE-EWS that has been provided on an interim basis by IOCARIBE.

24 France requested a clarification with respect to the status of French Guyana which has not a clear membership to CARIBE-EWS. The Secretariat responded that whether or not to include French Guyana in the system should be decided France. USA commented that considering the original concept of CARIBE-EWS, that include adjacent regions, both French Guyana and Brazil should also be considered as part of the system.

3.4 REPORT FROM IOC TSUNAMI UNIT

25 The Head of the Tsunami Coordination Unit reported to the Plenary on the status of the activities of the Unit. IOC established the Tsunami Coordination Unit in 2006 to coordinate all relevant activities for existing and developing Tsunami Warning Systems (TWSs). The Unit supports TWSs through their secretariats in Perth/IOTWS, Hawaii/PTWS, Cartagena/CARIBE-EWS, Paris/NEAMTWS, the Jakarta Tsunami Information Centre (JTIC), and with the

ITIC/Hawaii. He highlighted that the Unit is entirely funded by extra-budgetary resources. He explained that the Unit provides and has access to a wide variety of expertise in seismology, oceanography, communication and telecommunication, warning centre operations, computing and programming, legal affairs and general management. Its offices draw on local and regional knowledge and make it available to all Intergovernmental Coordination Groups and their Working Groups. The Unit is charged to raise synergy effects in the development and maintenance of the existing four TWSs. This includes the promotion of experiences and lessons learnt from other systems or from natural disasters, ensuring a consistent development of the ICGs. The Unit is pursuing the documentation of the state of a TWS, and the needs for its future development through a living Implementation Plan, and the documentation of a particular system's mandate, operations, responsibilities and performance through its Operations Plan, and the definitions of its communications and product development and delivery structure through its Communications Plan. In all, these plans will provide for the stakeholders of the systems a general outline to adapt these instruments to their needs and requirements.

26 Through the International Tsunami Information Centre —ITIC— in Hawaii, USA the Unit has been organizing and assisting in capacity building programmes and activities to numerous Member States, drawing on its longstanding expertise and valuable resources. These are now being implemented in the other, newer systems. It promotes the necessary awareness and preparedness measures to ensure the effectiveness of the TWSs. Other TICs are being developed in conjunction with the respective TWSs, or have been focused on nationally identified requirements as the J-TIC in Jakarta, Indonesia.

27 IOC interacts directly and continuously with the Permanent Delegations of Member States to UNESCO to ensure a viable and targeted communication. In this role, the Unit briefs the Permanent Delegations on developments and the status of the TWSs.

28 Through these efforts and the strong cooperation with the ICGs the Unit strives to minimize efforts and resources needed for Member States to develop and operate national tsunami warning systems at national, regional and global scales and maximize all efforts to reduce the risks of ocean-related hazards and save lives and livelihoods.

29 Trinidad and Tobago commented on the instrumentation required for local tsunamis, known to be more likely in the Caribbean than wide ocean events, which are more current in the Pacific and in the Indian Ocean. Because of this, community based warning systems are more important in this region and regional centres should be geared differently than in other regions. In particular, he suggested urgently setting up a set of community based systems. In his response the Head of the Unit emphasised that while solutions are local the experience gained from the different regions needs to be put to work to save resources and build efficient systems. The IOC Executive Secretary commented that national facilities should not be stopped and on the contrary should be encouraged, not limiting the national initiatives and building at the same time the regional system. Both are indeed closely linked.

3.5 REPORTS FROM UN AGENCIES

30 Mrs Jane S.P. Mocellin, Disaster Risk Reduction Advisor, UNDP Barbados & OECS Organization of Eastern Caribbean States, reported on three initiatives UNDP is promoting in the region:

- (i) the Risk Management Programme that looks for finding synergies with other UN Agencies for risk reduction and that includes support to enhance capacities of National

Meteorological Agencies in five countries of the region and a tsunami numerical modelling training for beginners,

- (ii) Information Management Systems Programme that includes supporting risk communication methods and emergency management data,
- (iii) Community Based Approaches that includes continually supporting the Research and Rescue project for tsunamis, volcano, earthquakes, with the Swiss Development Cooperation.

31 Mr Hugo Hidalgo, OMM/WMO NCAC office, reported on the contributions from WMO to the CARIBE-EWS through the existing WMO systems and programmes, in particular the WMO Global Telecommunication System (GTS). Trinidad and Tobago requested information on the status of the Caribbean segment of GTS. WMO's representative reported that the system has just been updated and is currently working.

32 The Complete presentation of all reports of intersessional activity is at <http://ioc3.unesco.org/cartws/icg-ii>.

3.6 NATIONAL PROGRESS REPORTS

33 Venezuela reported on the development of their national seismic network consisting of 36 broadband seismometers, including two CTBTO stations, all satellite connected. Information was provided on the ABC project that includes the installation of seismic stations in the islands: Aruba, Bonaire and Curacao, through an agreement between the Meteorological Center of Aruba, Netherland Antilles and FUNVISIS. With respect to risk prevention Venezuela reported on the Presidential Decree 3.481 del 17/02/2005 that refers among others to the National System of Risk Management ("*Sistema Nacional de Gestión de Riesgo*"). The National Direction for Hydrography of Venezuela (DHN, Direccion Nacional de Hidrografia) reported on the oceanographic instrumentation, equipments and platforms available from DHN for its use in the tsunami programme.

34 Nicaragua reported on the status of the national seismic network, all connected through optic fibber thanks to the cooperation of ENTRESA. A small seismic array has been installed in the facilities of INETER to enhance national capacity for evaluating the magnitude of seismic events. INETER uses SADC for data transmission. With respect to sea level measurements Nicaragua is installing a tide station in the Pacific cost. INETER informed that it provides a 24/7 service.

35 USA delivered an integrated presentation on the Caribbean Tsunami threat. In terms of numbers, the Caribbean Sea has 8% of the world's tsunami events and the Indian Ocean 7%. The historical record for tsunamis in the Caribbean area is not a solid reference for estimating tsunami potential life losses given the changes on population structure and also the relatively recent tourist developments in the region. The potential losses for a tsunami event in the region are high as 100,000 lives per century or 50,000 lives per big event only referring to beach attendance. USA called for a Caribbean Tsunami Warning Centre to be established to cope with this risk.

36 France presented the information available on Tsunamis in French West Indies. Ten events due to earthquakes and seven events due to volcano activity were identified between 1048 and 2007. The result of numerical simulation models developed using TUNAMI N2 and AVI NAMI was presented at the session. Bathymetric data, useful for tsunami modelling for both

Guadeloupe and Martinique bays is available. Following questions from the IOC Secretariat, UNDP clarified that the intention is to use the same model for training in the region. IOC Secretariat further clarified that IOC does not promote the use of specific products for tsunami numerical modelling.

37 USA presented StormReady which is a “grass roots” programme that focuses on improving communication and severe weather preparedness in communities, helping community leaders and emergency managers strengthen local safety programmes. A detailed description of the purposes, mechanisms and protocols for StormReady, which has 1,000 communities certified, was presented. The same concept applies to TsunamiReady which uses the same approach and has enabled 30 communities in the USA.

38 France presented the seismic monitoring system in the Antilles through the Observatory in Martinique with fifteen short period and one broadband stations (volcano) and Guadeloupe with twenty four short-period and four broadband stations (volcano). The network has been installed between 1960 and 1980 without recent updates and all uses radio transmission. The observatories publish a monthly bulletin with seismic events. France is looking to contribute four new stations (two in Guadeloupe and two in Martinique) with a total budget of € 300,000 including satellite communication links. There are no current plans for French Guyana but it could be considered in the future. With respect to sea level gauges run by SHOM there are four newly installed (2006) sea level gauges with delayed transmission. With respect to bathymetry for modelling purposes there are gaps in the deeper zones around Guadeloupe and Martinique. Modelling is performed by CEA and Dr Narcisse Zahibo, Associated Professor, Campus de Fouillole, Guadeloupe.

39 Cuba presented its National Proposal for Tsunami Warning under the National Civil Defence (“Defensa Civil Nacional”). Cuba does not have real time seismic monitoring. Trinidad and Tobago asked about the level of cooperation Cuba expects from other countries for data exchange. The delegate of Cuba explained that in GLOSS and in the WMO as well as in seismic monitoring Cuba does cooperate with many countries.

40 Colombia presented a report on the vulnerability level of the Caribbean Colombian coast to tsunamis. The Tsunami programme in Colombia has been in place from 1984 but initially only for the Pacific coast. Three big cities and a number of medium size towns are tsunami risk prone along the Caribbean coast. This represents a change with respect to the Pacific coast where there are not big cities under risk. With respect to seismic monitoring three broadband stations are planned for 2007 and for sea level monitoring there are two sea level stations but with hourly transmission. With respect to preparedness Colombia has some evacuation experiences in the Pacific coast, particularly in Tumaco where a drill was performed in 2006. Panama asked for possibilities of cooperation on tsunami modelling. The representative of Colombia offered support and cooperation.

41 **The ICG approved Recommendation [ICG/CARIBE-EWS II.1](#).**

3.7 REPORT OF THE INTERIM ADVISORY SERVICES

42 Ms Christa G. von Hillebrandt-Andrade on behalf of Dr Charles McCreery, Director NOAA Richard H. Hagemeyer Pacific Tsunami Warning Center (PTWC) presented the Current Status and Outstanding Issues of the Interim Operational Tsunami Warning Services provided to CARIBEEWS. The report indicates that five US DART buoys are already transmitting information used for the CARIBE-EWS and 10 new Global Seismic Network (GSN) stations are being installed in the region to enhance the capacity of detection of tsunamigenic earthquakes.

43 The report included the proposed criteria for CARIBE-EWS products and the WMO/GTS and AWIPS IDs for CARIBE-EWS products.

44 The PTWC informed the Plenary on the status list of Focal Points made available to PTWC and their intention to run communication tests during the week of 19–24 March 2007. On this issue PTWC requested a clear procedure for maintenance of the Focal Point list, agreement on the magnitude criteria, forecast points and product types. As well, PTWC proposes to consider a two-level warning procedure: level 1 being to clear beaches and harbours and level 2 being full-scale evacuation.

45 UNDP commented that a 30-minute warning product to be delivered by PTWC is useless in the Caribbean Arc. Mrs Hillebrandt-Andrade commented that PTWC is providing services within 10 minutes in some cases but it is true that the communication dissemination can take additional 10 or 15 minutes depending on the status of the distributing network. Thus, an interim system can deliver with some limitations. The IOC Executive Secretary commented that at the same time of improving the performance of systems, we need to recognise the limits of the available science and technology. This is clearly calling for a risk management approach that limits the damages by increasing public awareness and preparedness.

46 In his report, the PTWC representative refers to the draft Communications Plan that also includes proposed forecast points for the region. These points should be carefully reviewed by Member States to check consistency for the localisation and complementarities with the proposed location of national instruments for measuring sea level.

47 **The ICG approved Recommendation [ICG/CARIBE-EWS II.2](#).**

4. INTERSESSIONAL WORKING GROUP PROGRESS REPORTS

4.1 WORKING GROUP 1 PROGRESS REPORT: TSUNAMI AND COASTAL INUNDATION HAZARD RISK ASSESSMENT AND RESEARCH

48 The Chairman of Working Group 1, Dr Aurelio Mercado-Irrizarri, reported on the intersessional activities of the group. He referred to Doc. ICG/CARIBE-EWS II/6. While there have been no intersessional meetings of this group, the Chairman distributed a set of draft recommendations to the group members that received only limited feedback. He presented the set of recommendations that includes establishing a modelling working group to provide tsunami inundation mapping and forecasting capability for the region, to develop and accept modelling and data standards for operational model use (based on UNESCO ICG/IOTWS and NOAA model standards), to develop community model activity for the interested Member States. The proposed group would also develop capacity building in the region facilitating the construction of tsunami inundation maps under different local worst case scenarios; develop local real-time forecasting capabilities compatible with regional tsunami forecast and warning procedures using the deployed DART II buoys for the interested Member States and use ComMIT (Community Model Interface for Tsunami) internet enabled interface developed for the UNESCO ICG/IOTWS.

4.2 WORKING GROUP 2 PROGRESS REPORT: MONITORING AND DETECTION SYSTEMS, WARNING GUIDANCE

49 The Chairmanship of Working Group 2 is vacant. This Working Group addressed Sea Level Monitoring and Seismic Monitoring. Mrs Christa von Hillebrandt-Andrade, Vice-chair of

this group reported on the intersessional activities, referring to document ICG/CARIBE-EWS II/7. The group proposed the integration of seismic data available under the different networks, namely the USGS, the Puerto Rican Seismic Network (PRSN), the Seismic Research Unit (SRU) from Trinidad and Tobago and the network managed by FUNVISIS from Venezuela. The report includes a comparison between the timeline for responding to events from PRSN and PTWC that shows clear advantages for a locally based centre. With respect to sea level monitoring the group proposed the establishment of a consortium (network) of regional sea level measurement interested Member States, to be organized within the framework of IOCARIBE-GOOS.

50 The Working Group particularly recommended that strong links between the ICG and WMO's RA IV Hurricane Committee should be established.

51 Report of Working Group 2 included a Caribbean Tsunami Warning Centre (CTWC) proposal that was prepared by an Ad-hoc Working Group established at the Preparatory Meeting in San Juan, Puerto Rico. The proposal is available under document ICG/CARIBE-EWS II/9. SRU from Trinidad and Tobago has volunteered to finalize the longer version of this proposal.

52 **The ICG approved Recommendation [ICG/CARIBE-EWS II.3](#).**

4.3 WORKING GROUP 3 PROGRESS REPORT: WARNING, DISSEMINATION AND COMMUNICATION

53 The Chairman of Working Group 3, Dr Roy Watlington, reported on the intersessional activities and explained the recommendations under Doc. ICG/CARIBE-EWS II/8. This group was charged with comparing the various communication systems available, including EMWIN, for the rapid warning/alerting and information dissemination in the Caribbean, including technical specifications, speed, capabilities, bandwidth and cost. Dr William Proenza presented the EMWIN system. The ICG received a report establishing that EMWIN is available 24x7 with all National Weather Service (NWS) service offices, bears no charges beyond the modest start-up investment nor other recurring subscription requirements and that EMWIN has already proven to be satisfactory for some countries in the region. NOAA/National Weather Service, through a Department of State grant will be delivering 24 EMWIN turn key units to the following Third Water Initiatives (TBI): Bahamas (host), Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St. Kitts/Nevis, St. Lucia, St. Vincent/Grenadines Suriname, Trinidad/Tobago. Working Group 3 recommended ICG to interact with CDERA.

54 **The ICG approved Recommendation [ICG/CARIBE-EWS II.4](#).**

4.4 WORKING GROUP 4 PROGRESS REPORT: PREPAREDNESS, READINESS AND RESILIENCE

55 This group was not constituted in the intrasessional period. However, and following the preparatory meeting held in San Juan, Puerto Rico, 29–30 November 2006, Mrs Lorna Inniss from Barbados was requested to coordinate the final version of a proposal for the establishment of a Caribbean Tsunami Information Centre (CTIC), following the initial expression of interest by Barbados and Venezuela in hosting such a Centre. Mrs Lorna Inniss reported on the status of the CTIC proposal, available as document ICG/CARIBE-EWS II/12. Under this agenda item the Chairman invited Mr Israel Matos to comment on the “Tsunami Ready Communities Programme” which build from the experience of the StormReady Programme and basically looks to improve the community's response to tsunamis.

5. SESSIONAL WORKING GROUPS

56 The Chairman invited the Plenary to consider the reports of the Chairs of the Sessional Working Groups and to request actions as needed.

Working Group on the Terms of Reference for intersessional ICG Working Groups:

Chairman: Mr Hernan Perez Nieto, Venezuela

57 The group reviewed the existing documents adopted as Terms of Reference for WGs 1, 2, 3, 4 of the ICG as the ICG/CARIBE-EWS I session, and redefined the purpose and functions of each of them. Working Group 2 (Former WG 1 Inundation Hazard Risk Assessment and Research) was renamed “Hazard Assessment”.

58 As well, the Group proposed a common structure for the Terms of Reference of all working groups with respect to: Languages, Meetings, Coordinator and elections, Members & appointment, Calendar of intersessional work, Duration of the WG, Reports, Financial resources and Amendments.

59 **The ICG approved Recommendation [ICG/CARIBE-EWS II.5](#).**

Working Group on ICG Seismic and Sea Level monitoring standards:

Chairman: Mr Lloyd Lynch, Trinidad y Tobago

60 The group reviewed the two documents containing standards for observation systems submitted to the ICG/CARIBE-EWS II. Namely documents ICG/CARIBE-EWS II/Inf. 4 (*Manual on Sea Level Measurement and Interpretation; Volume IV: An Update to 2006*, IOC Manuals and Guides 14) and ICG/CARIBE-EWS-II/Inf 5 (Summary of IASPEI, New Manual of Seismological Observatory Practice (NMSOP), GeoForschungsZentrum Potsdam, 2002). The group found that these documents could be adopted as standard practice, and suggested reviewing these documents to include additional information on the specifications, installation and maintenance of tsunami observation systems.

61 The group suggested enhancing regional capacity through training of nationals from Member States of the ICG/CARIBE-EWS to carry out maintenance and calibration of the most commonly used instruments.

62 The Plenary discussed at length the recommendation from former intersessional Working Group 2 to establish a Sea Level Consortium. Consensus emerged from Member States to further analyse this proposal before endorsement.

63 **The ICG approved Recommendation [ICG/CARIBE-EWS II.6](#).**

64 **The ICG approved Recommendation [ICG/CARIBE-EWS II.7](#).**

Working Group on the Caribbean Tsunami Information Centre:

Chairman: Ms Lorna Inniss, Barbados

65 The group reviewed and discussed document ICG/CARIBE-EWS II/12. The group confirmed the strong need to have a permanent Information Centre. The group reviewed the roles and responsibilities of CTIC as defined in the draft proposal, as well as budgetary and staffing issues.

66 According to the group, the overarching goal for a CTIC should be to create a “Caribbean Tsunami Community” comprising researchers, educated policy makers, CTWC, 24/7 TWFP and TNC, and a network of national mechanisms for early warning, and “tsunami- ready” populations, especially in vulnerable coastal areas.

67 The group agreed that the critical path to establish the centre is to define its location, based in the initial offers from Barbados to host and Venezuela to support.

68 With respect to the staffing the group suggested that the Director should not necessarily be a strong technical person, but be able to communicate with Member States effectively, supported by a Programme Officer and a Communications Specialist.

69 **The ICG approved Recommendation [ICG/CARIBE-EWS II.8](#).**

6. CARIBE-EWS IMPLEMENTATION PLAN: TRANSITION FROM ACTION PLAN TO IMPLEMENTATION

70 The Chairman invited the IOC Secretariat to inform the Plenary on the role of an Implementation Plan in providing transparency and guidance to Member States to build the CARIBE-EWS. The Head of the Tsunami Unit explained the role of the Implementation Plan and the structure it has in the IOTWS and in other regions. He provided a template for ICG CARIBE-EWS Implementation Plan and suggested using this as a rolling document to measure performance and advances. To that end the Secretariat will develop a draft Implementation Plan to be submitted to the ICG/CARIBE-EWS III.

71 **The ICG recommended** the adoption of the Implementation Plan to be developed for the Caribbean and Adjacent regions by the IOC Secretariat, as a permanent tool for monitoring the establishment and performance of the CARIBE-EWS

6.1 SECRETARIAT TO ICG/CARIBE-EWS

72 The Chairman summarised the existing arrangements for the interim Secretariat. The Head of the Tsunami Unit explained that the IOCARIBE Secretary was assigned on an interim basis for following up the initial steps in building ICG/CARIBE-EWS; however this is a full time job that needs a dedicated staff in the region. The IOC Executive Secretary further explained that UNESCO does not have resources for establishing a Secretariat but do have the mechanisms to establish a subsidiary special account to receive Member States contributions. If UNESCO/IOC is given the resources then a Secretariat can be established.

73 Trinidad and Tobago commented that many of the pending tasks could be accelerated with funding. The Chairman expressed that IOCARIBE should have office space to host the Secretariat for the ICG but resources are requested.

74 **The ICG approved Recommendation [ICG/CARIBE-EWS II.9](#).**

7. PROGRAMME AND BUDGET FOR 2008–2009

75 The Chairman of the intrasessional Working Group on Budget 2008–2009, Mr Israel Matos from USA reported on the results of the group deliberations. The group prepared a budget proposal for 2008 and 2009 with detailed estimates for core components of a CARIBE-EWS. The proposal includes the cost for establishing a Caribbean Tsunami Warning Centre (CTWC), a

Caribbean Tsunami Information Centre (CTIC) and the Secretariat for the ICG. As well estimates are provided for technical components including seismic and sea level monitoring and communications. He further clarified that some components may already have financial support (i.e. EMWIN installations for some countries). Following an intervention from the USA, Ms Christa Hillebrandt-Andrade offered to provide an estimate for valuing the seismic monitoring contributing to current seismic data exchange. The IOC Executive Secretary gave an overview on the three sources IOC uses for financing its activities in the Tsunami Programme: multilateral funds, bilateral funds, national funds. He further explained that regular cost for maintaining the systems are in essence nationally funded. Following an intervention from the Secretariat the group agreed to further refine the proposal in the next months and to call it estimated cost instead of budget to avoid confusions with the budget process of UNESCO.

76 **The ICG approved Recommendation [ICG/CARIBE-EWS II.10](#).**

8. NEXT SESSION

8.1 CONFIRMATION OF DATE AND PLACE OF THE ICG/CARIBE-EWS III

77 Panama offered to host the next ICG Session. The ICG suggested convening the session in January 2008. Exact dates will be suggested by the Secretariat. The representative of the Dominican Republic requested the Secretariat to secure the follow up of the Working Groups and support their continued work in order to be able to review progress at the next session.

8.2 TARGET DATE FOR ICG/CARIBE-EWS IV

78 France and Cuba informed the Plenary that they will consider hosting the Fourth session. The group agreed to target January 2009 for the Fourth Session.

9. OTHER BUSINESS

79 Dr Patricio Bernal, IOC Executive Secretary, congratulated Mr Williams (Bill) Proenza from the USA Delegation for his nomination as Director of the Hurricane Center Miami, USA. He expressed that his nomination gives a good prospective for natural partnership with the ICG. Delegates concurred with this and congratulated Mr Proenza. Mr Proenza thanked the delegates, stated he has been working with the Caribbean Member States for many years and is available for any cooperative vital service as equal partners, for the developing of the system in the Caribbean.

10. ADOPTION OF THE SUMMARY REPORT AND RECOMMENDATIONS

80 The Chairman of the intrasessional Working Group on Draft Recommendations, Guillermo Garcia from Cuba informed the Plenary that the group received 12 Recommendations to review. He indicated that Spanish versions of the Recommendations were not immediately available as some draft recommendations were delivered late in the morning. Following his suggestion and with no objection Delegates agreed to work on the English version of the recommendations.

81 **The ICG approved Recommendation [ICG/CARIBE-EWS II.11](#).**

82 **The ICG approved Recommendation [ICG/CARIBE-EWS II.12](#).**

83 The adopted Recommendations are in full text in Annex II.

11. CLOSURE

84 Cuba, on behalf of delegates thanked the Government of Venezuela, FUNVISIS and the organisers for their excellent performance in the organisation and implementation of the session.

85 The IOC Executive Secretary expressed the importance of free data exchange for protecting lives. He highlighted that the IOC tsunami programme is building on the momentum created by the tragedy in the Indian Ocean. Today there is a network working in the Indian Ocean for tsunami detection and the system is slowly building local capacities for tsunami readiness.

86 The delegate of the USA expressed the positive views of his delegation in working in such a cooperative environment, where the sharing of cultures that happened during the session enhanced its results. The Dominican Republic remarked the quality of the preparative work for the session, including local Government facilities provided. She congratulated the Chairman for the insight and guidance provided. Barbados joined the congratulations and called the attention to the low representation of Small Island States (SIDS) in these critical meetings and called for increased attention to it.

87 During his closing remarks as Chairperson of the Session, Dr Gustavo Malavé noted thanks for all the positive comments and the national and local support provided by the Government of the Bolivarian Republic of Venezuela, as well as the support from the Venezuelan Minister of Foreign Affairs and Petroleos de Venezuela (Pedevesa). He also thanked the Delegates and Representatives for their active participation in the session and extended his appreciation to the local organizing committee and especially to the staff of FUNVISIS.

88 The Second Session of the IOC Intergovernmental Group for the Tsunami and other Coastal Hazards Warning system for the Caribbean Sea and Adjacent Regions was closed at 17:00 hrs at the Cumanagoto Hotel, Cumana, Venezuela, on Wednesday, 14 March 2007.

ANNEX I

AGENDA

- 1. WELCOME AND OPENING**
- 2. ORGANIZATION OF THE SESSION**
 - 2.1 Adoption of Agenda
 - 2.2 Designation of the Rapporteur
 - 2.3. Conduct of the Session, Timetable and Documentation
- 3. REPORT ON INTERSESSIONAL ACTIVITIES**
 - 3.1. IOC Executive Secretary's Report
 - 3.2. Chairman's Report
 - 3.3. CARIBE EWS Secretariat Report
 - 3.4. Report from IOC Tsunami Unit
 - 3.5 Reports from UN Agencies
 - 3.6 National Progress Reports
 - 3.7 Interim Advisory Services Report
- 4. WORKING GROUP PROGRESS REPORTS**
 - 4.1. Working Group 1 Progress Report: Tsunami and Coastal Inundation Hazard Risk Assessment and Research
 - 4.2. Working Group 2 Progress Report: Monitoring and Detection Systems, Warning Guidance
 - 4.3. Working Group 3 Progress Report: Warning, Dissemination and Communication
 - 4.4. Working Group 4 Progress Report: Preparedness, Readiness and Resilience
- 5. SESSIONAL WORKING GROUP MEETINGS**
- 6. CARIBE-EWS IMPLEMENTATION PLAN (Former Action Plan): STATUS OF IMPLEMENTATION**
 - 6.1. SECRETARIAT to ICG/CARIBE EWS
- 7. PROGRAMME AND BUDGET FOR 2008-2009**
- 8. NEXT MEETING**
 - 8.1. - Confirmation of date and place of ICG/CARIBE EWS-III
 - 8.2. - Target date for ICG/ CARIBE EWS-Iv
- 9. ANY OTHER BUSINESS**
- 10. ADOPTION OF DECISIONS AND RECOMMENDATIONS**
- 11. CLOSURE OF THE MEETING**

ANNEX II

ADOPTED RECOMMENDATIONS

N°:	Agenda Item	Title	Page
1	3.6.	National Progress Reports	<u>2</u>
2	3.7	Communications Plan for the Interim Advisory Information Service to the Caribbean and Adjacent Regions	<u>2</u>
3	4.2	A Caribbean Tsunami Warning Centre	<u>3</u>
4	4.3	Regional Workshops on the Caribbean Tsunami Warning System	<u>4</u>
5	5	Terms of Reference for the intersessional Working Groups	<u>4</u>
6	5	Workshop on Standards for Tsunami Early Warning System for the Caribbean and Adjacent Regions	<u>7</u>
7	5	Establishment of a Sea Level Consortium	<u>7</u>
8	5	Establishment of a Caribbean Tsunami Information Centre	<u>8</u>
9	6.1	The Caribbean Tsunami and Other Coastal Hazards EWS Permanent Technical Secretariat	<u>9</u>
10	7	Budget for the Biennium (2008–2009) for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions.	<u>9</u>
11	5.1	Regional Symposium on Tsunami Science and Services for Impact Mitigation	<u>10</u>
12		Regional Coverage and Steps Forward	<u>11</u>

Recommendation ICG/CARIBE-EWS II.1

NATIONAL PROGRESS REPORTS

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recognizing the usefulness of sharing among the Member States and the corresponding organizations linked with the ICG CARIBE the progress of the Member States in the Caribbean Tsunami Warning System,

Considering that a template could facilitate the reporting process,

Considering also that other ICGs have templates that are used for the national reports,

Recommends that the IOC Secretariat prepare a template for the national progress reports of the region which includes their standard decision procedures for issuing warnings, the contact information for their tsunami warning focal points and their national tsunami contact point and observational and technical infrastructure;

Recommends also that the Member States submit a National Report using the provided template for every ICG meeting;

Recommends that the ICG post these reports on the ICG CARIBE EWS web site.

Financial Implications: None.

Recommendation ICG/CARIBE-EWS II.2

**COMMUNICATIONS PLAN FOR THE INTERIM ADVISORY INFORMATION
SERVICE TO THE CARIBBEAN AND ADJACENT REGIONS**

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recalling that ICG/CARIBE-EWS I requested that the Pacific Tsunami Warning Center prepare a Communication Plan for the Interim Tsunami Advisory Information Service to the Caribbean Sea and Adjacent Regions,

Acknowledging that the Pacific Tsunami Warning Center submitted the Plan in July 2006,

Considering that the Plan was distributed to the Member States for consideration,

Recommends that the Plan be approved;

Recommends that the Member States review the preliminary forecast points that are under a Member State's jurisdiction and inform the Pacific Tsunami Warning Center of any modifications;

Recommends that the PTWC carry out regular communication tests among the participants.

Financial Implications: None

Recommendation ICG/CARIBE-EWS II.3

A CARIBBEAN TSUNAMI WARNING CENTRE

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Having considered the report of the Session Chairman, the CARIBE EWS Secretariat Report and the intersessional Working Groups' reports,

Recalling, the ICG/CARIBE-EWS I Report and IOC Resolution XXIII-13, approving the establishment of an Intergovernmental Coordination Group for Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions,

Noting directions and guidance provided by the ICG/CARIBE-EWS I for the establishment of a Tsunami Warning Centre,

Acknowledging the interim services provided by the Pacific Tsunami Warning Center (PTWC) to the Caribbean and Adjacent Regions,

Recommends to establish a Caribbean Tsunami Warning Centre to be located in the region;

Requests the IOC Executive Secretary to conduct consultations with Member States that are interested in hosting and operating the recommended Centre;

Urges Member States to provide proposals to IOC (UNESCO) to host and operate the recommended Centre;

Further urges Member States and international and regional organizations to provide financial and human resources to the recommended Centre;

Financial implications: None

Recommendation ICG/CARIBE-EWS II.4

REGIONAL WORKSHOPS ON THE CARIBBEAN TSUNAMI WARNING SYSTEM

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Considering the operational warning capacity already in place developed at regional level regarding hurricane and other natural hazards,

Recognizing the need for a capacity building process that ensures that all Member States be properly prepared to understand, process and respond to tsunami and other coastal hazard warnings in the Caribbean and Adjacent Regions,

Recommends organizing a series of workshops on the Caribbean tsunami warning system for national Tsunami Warning Focal Points (TWFP);

Recommends also the first two workshops to be organized before the end of 2007, including one for English speaking countries and another for Spanish speaking countries.

Financial Implications: 50,000 USD from extra budgetary sources

Recommendation ICG/CARIBE-EWS II.5

TERMS OF REFERENCE FOR THE INTERSESSIONAL WORKING GROUPS

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recognizing that four intersessional working groups were established at ICG/CARIBE-EWS I in January 2006,

Recalling the Terms of Reference, objectives and recommendations adopted at ICG/CARIBE-EWS I,

Considering the binding rules of procedures applying to IOC subsidiary bodies,

Acknowledging the efforts of members of the working groups during the intersessional period,

Bearing in mind that clear and consistent terms of reference will facilitate the achievement of the objectives of the working groups,

Recommends the adoption of the Terms of Reference for the Intersessional Working Groups as provided in Annex I of this recommendation;

Urges the Member States to nominate their representatives to the Working Groups.

Financial Implications: None

Annex I

Terms of Reference Working Groups ICG/CARIBE-EWS

Working Group One: Monitoring and Detection Systems, Warning Guidance

Purpose: To review and recommend to the ICG priorities and actions required towards the full establishment of a coordinated regional tsunami warning system.

Functions:

1. Advise Member States on the monitoring and detection capabilities needed for operating national tsunami warning centres.
2. Define the threshold criteria for the monitoring and warning systems.
3. Assure the compliance with the agreed standards for the detection systems.
4. Ensure the effectiveness of the warning system by promoting the open exchange of seismic, sea level and other observational data in real time.
5. Promote the sharing of experience and expertise and capacity building essential to the effective monitoring and issuance of warnings.
6. Ensure the establishment of a fully interoperable regional tsunami warning system.

Working Group Two: Hazard Assessment

Purpose: To advise the ICG on the identification and characterization of coastal hazards, their assessment and the required modeling.

Functions:

1. Review and evaluate the required methods and data sets, including bathymetry and coastal topography for determining the coastal hazards.
2. Advise the Member States on the requirements for operating the appropriate models.
3. Develop capacity building for the appropriate modelling.

Working Group Three: Warning, Dissemination and Communication

Purpose: To advise the ICG on means of identifying best practices and needs, as well as solutions for information gaps and outstanding problems in receiving and disseminating warnings and advisories for an end to end early warning system.

Functions:

1. Provide technical requirements on the receiving and dissemination of messages to the decision makers and the community at large.
2. Develop strategies so that the MS can have the capacity for their NTWC based on the assessment Questionnaires.

3. Oversee institutional arrangements for warning dissemination and communication.

Working Group Four: Preparedness, Readiness and Resilience

Purpose: To advise and recommend to the ICG strategies to enhance the preparedness, readiness and resilience capabilities and to develop the necessary recommendations, tools and procedures.

Functions:

1. Identify the strategies that the MS can integrate into their national risk reduction programmes.
2. Provide guidelines to the Member States for policies and legislation for emergency prevention, mitigation and response.
3. Define strategies for the implementation of national plans for the preparedness and response of the communities which should include training, dissemination and evacuation procedures.

The following applies for the four working groups:

- Languages: English, Spanish and French
- Meetings: Meet intersessionally.
- Coordinator and Elections: Follow the rules of procedures applying to IOC Subsidiary Bodies. Chair and at least one vice chair who will be elected by the members of the working group for two years with possible re-election of one term in the same position.
- Members and appointment: Nominated by Member States in accordance with the rules of procedures applying to IOC Subsidiary bodies. Technical experts can be invited at the discretion of the Chair.
- Calendar of Intersessional work should be determined by the working group at the working group meeting and included in the report.
- Duration of the WG: Two years.
- Reports: A final report has to be submitted two months before the parent body meeting and for each working group meeting within the two following months.
- Financial resources: At national expense.
- Amendments: As warranted by the working groups.

Recommendation ICG/CARIBE-EWS II.6

**WORKSHOP ON STANDARDS FOR TSUNAMI EARLY WARNING SYSTEM
FOR THE CARIBBEAN AND ADJACENT REGIONS**

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Considering the need to establish and maintain standards of seismic, sea level, and other observation systems operated by contributing institutions,

Recognizing the importance and existence of guiding documentation such as IASPEI-New Manual of Seismological Observatory Practice, The Manual on Sea Level Measurements and Interpretation and CARIBE EWS Implementation Plan,

Recommends that these documents be adopted as standard practice, and review these documents to include additional information on the specifications, installation and maintenance of tsunami observation systems; and

Recommends also that regional capacity be enhanced through training of regional personnel to carry out maintenance and calibration of the most commonly used instruments.

Financial Implication

Training of three technicians at 3 of most commonly used seismological instruments	
Three persons for 1 month	\$ 30K
Workshop to revise the manuals (10 Persons for 2 days)	\$ 25K

Recommendation ICG/CARIBE-EWS II.7

ESTABLISHMENT OF A SEA LEVEL CONSORTIUM

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recognizing that the currently available sea level data from the region are insufficient for the Caribbean Tsunami Warning System,

Noting the deficiency in the sea level observation capacity,

Recognizing that several efforts are underway to upgrade and install new sea level stations,

Recognizing the multi hazard applications of the sea level gauges,

Considering that a greater synergy among GLOSS programme participants and sea level station operators in the region will contribute to a more effective and interoperable sea level network,

Bearing in mind that a consortium of Seismic Network Operators (MIDAS) has existed in the region since 1990, which facilitated the implementation of seismic data exchange mechanisms in the region,

Recommends the ICG member states to consider and evaluate before the next ICG meeting the necessity of having a Sea Level Consortium for the Caribbean.

Financial Implications: None

Recommendation ICG/CARIBE-EWS II.8

ESTABLISHMENT OF A CARIBBEAN TSUNAMI INFORMATION CENTRE

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recalling the need identified by Member States for the establishment of a regional Tsunami Information Centre to disseminate knowledge on tsunami warning systems and assist in the development of national components, among other services,

Acknowledging the limitations in human resources and technological capacity in many Caribbean Member States, needed to build a resilient end-to-end system,

Further acknowledging the invaluable role played by the International Tsunami Information Centre,

Recommends the establishment of a Caribbean Tsunami Information Centre with clear and agreed roles and responsibilities, staffing requirements and commitments by Member States for its sustainability;

Requests the IOC Executive Secretary conduct consultations with Member States that are interested in hosting and operating the recommended centre;

Urges Member States to provide proposals to IOC (UNESCO) to host and operate the recommended centre

Financial Implications: in US\$

Item	Amount	Source
Set up + year One	650,000	Extra-budgetary
Year Two	450,000	Extra-budgetary
Year Three	450,000	Extra-budgetary

Recommendation ICG/CARIBE-EWS II.9

**THE CARIBBEAN TSUNAMI AND OTHER COASTAL HAZARDS EWS
PERMANENT TECHNICAL SECRETARIAT**

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Having considered the report of the CARIBE-EWS Technical Secretary (a.i.) and the ICG/CARIBE-EWS Vice-Chair at this Session,

Noting with concern that the Technical Secretariat is interim and it is providing support with extremely limited resources that affect the efficiency for the establishment of the system,

Instructs the IOC Executive Secretary to seek ways and means to secure funds for the establishment of a permanent CARIBE-EWS technical secretariat;

Further instructs the IOC Executive Secretary to open a special IOC “CARIBE-EWS” Subsidiary Special Account to allow Member States and organisations to provide funds for the establishment of a permanent CARIBE-EWS technical secretariat;

Urges Member States and international and regional organizations to provide voluntary contributions to the IOC “CARIBE-EWS” Subsidiary Special Account in order to assist the Commission in the effective provision of secretariat services for the assessment, planning and implementation of the regional early warning and mitigation system.

Financial implications: None

Recommendation ICG/CARIBE-EWS II.10

**BUDGET FOR THE BIENNIUM (2008–2009)
FOR THE TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM
FOR THE CARIBBEAN SEA AND ADJACENT REGIONS.**

The Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recognizing the need of a Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Considering that Caribbean Tsunamis, differing from hurricanes, have a time scale of minutes, which requires effective regional monitoring and warning operations and that Member States, Emergency/Disaster Management and the population at large need to understand and respond appropriately to the natural signs and/or to the warnings that may be issued by national and regional Tsunami Warning Centres,

Recalling IOC Resolution XXIII-13 and the recommendations of the First Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Emphasizing the need for a multi-hazards approach in order to take advantage of other existing available systems and financial sources,

Acknowledging that Member States and other UN bodies and organizations are willing to assist in the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions,

Bearing in mind that almost all Member States have a communication system (GTS/EMWIN) at their National Meteorological and Hydrological Services that can be used as the backbone communication system for tsunami warnings,

Calls on the recommendations of the First Session of the ICG/CARIBE-EWS in Barbados along with its action plan;

Urges the IOC Executive Secretary to look for financial resources to implement the CARIBE-EWS.

Financial implications: in US\$

Item	Immediate Cost	Total Cost Estimate 2008-2009
Capacity Building	200,000	508,000
Comm. & Equipment	50,000	2,880,000
Data collection & Mapping	150,000	5,790,000
Administration	100,000	700,000
Outreach Education	10,000	100,000
TOTAL	510,000	9,343,000

* Total budget for implementation of the whole system is USD 25 Millions, 5M/year.

** For the present budget request (2008–2009) we have identified USD 2,515,000 available from Donors/Member States.

Recommendation ICG/CARIBE-EWS-II.11

**REGIONAL SYMPOSIUM ON TSUNAMI SCIENCE
AND SERVICES FOR IMPACT MITIGATION**

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Considering the importance to convene a regional scientific symposium to facilitate sharing information on science and technology for operational warnings on tsunami and other coastal hazards,

Bearing in mind that the next IOCARIBE-X Session, will be held in Venezuela in April-May/2008,

Recommends to organize, in coordination with the Regional IOC Sub-Commission, just prior to the next IOCARIBE-X Session, Venezuela (April-May/2008) a scientific symposium under the main theme: “Tsunamis in the Caribbean: science and services for impact mitigation”;

Recommends also the Chairs of the ICG to designate a Steering Committee for the Symposium;

Decides also that the Symposium Steering Committee, when designated, should:

- a) Prepare proposals on the content of the Symposium and other organizational details.
- b) Prepare a draft list of participants to be considered and approved by the Chairs of the ICG CARIBE.
- c) Inform regularly the Chairs of the IOCARIBE Sub-Commission and of the ICG/CARIBE-EWS, on the advances of the organization process.

Financial Implications: US\$ 50,000

Recommendation ICG/CARIBE-EWS II.12

REGIONAL COVERAGE AND STEPS FORWARD

The Intergovernmental Coordinating Group for the establishment of a Tsunami and Other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions,

Recognizing the progress made in establishing tsunami warning capabilities in all countries of the Caribbean and Adjacent Regions since the Sumatra Tsunami in 2004,

Reaffirming that the CARIBE-EWS will be a coordinated network of national systems and capacities, potentially operated through a regional centre, and will be part of a global network of early warning systems for all ocean-related hazards,

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

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

Acknowledging

- (i) the interim coverage for tsunami advisory information provided to the Caribbean and adjacent Seas by the Pacific Tsunami Warning Centre (PTWC),
- (ii) the continuing support of the IOC/ITIC (International Tsunami Information Centre) to assist the ICG/CARIBE-EWS and its Secretariat in development of communications and capacity-building activities,

Urges all Member States in the region to nominate their national Tsunami Warning Focal Points (TWFP) and their Tsunami National Contact (TNC) by the end of 2007, and

Agrees to:

- Establish an initial core system for detecting and verifying tsunamis with the CARIBE-EWS by the end of 2008.
- Assist Member States in the development of down-stream capacities to provide warning information at the community level.
- Actively plan to take over the full responsibility for the system with a Caribbean Tsunami Warning Centre in the region at least by 2010 and thus end with great appreciation the interim coverage provided by PTWC.

Financial implications: see Budget for the biennium (2008–2009)

ANNEX III

LIST OF PARTICIPANTS

1. ICG BOARD

Vice-Chair ICG

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ANNEX IV

ACRONYMS AND ABBREVIATIONS

CDERA	Caribbean Disaster Emergency Response Agency
CEPREDENAC	Central American Coordination Center for Disaster Prevention
CTIC	Caribbean Tsunami Information Center
CTWC	Caribbean Tsunami Warning Center
DART	Deep-Ocean Assessment and Reporting of Tsunami
FDSN	Federation of Digital Broad-band Seismograph Networks
FEMA	Federal Emergency Management Agency
GLOSS	Global sea level Observing System
GOOS	Global Ocean Observing System
GPS	Global Positioning System
GTS	Global Telecommunication System
ICG/CARIBE-EWS	Intergovernmental Coordination Group for the Caribbean Tsunami Warning System
ICG/IOTWS	Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning & Mitigation System
INETER	Instituto Nicaraguense de Estudios Territoriales
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
ISDR	International Strategy for Disaster Reduction
ITIC	International Tsunami Information Centre
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
NGO	Non-Governmental Organizations
NMHS	National Meteorological and Hydrological Services
NOAA	National Oceanographic Atmospheric Administration (USA)
NWS	National Weather Service
PRSN	Puerto Rico Seismic Network
PTWC	Pacific Tsunami Warning System
SRU	Seismic Research Unit
TCHGE	Tsunami and Coastal Hazards Group of Experts
TWS	Tsunami Warning System
UN	United Nations
UNDP	United Nations Development Programme

UNESCO	United Nations Educational, Scientific & Cultural Organization
UNGA	United Nations General Assembly
USGS	United States Geological Survey
UWI	University of the West Indies
WCDR	World Conference on Disaster Reduction
WMO	World Meteorological Organization

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20. Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987	E, F, S, R
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22. Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987	E only
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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
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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
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35. Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991	E, F, S, R
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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
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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
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66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	E only
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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
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87.	Thirty-fourth Session of the Executive Council, Paris, 2001	E, F, S, R
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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
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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), Mombassa, 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*