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 (ICG/CARIBE EWS)

Seventh Session

Willemstad, Curacao
2–4 April 2012

UNESCO

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IOC/ICG/CARIBE EWS-VII/3
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[1] The Executive Summary is available in English, French, Spanish and Russian as IOC/ICG/CARIBE EWS-VII/3s

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Executive Summary

The Seventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-VII) was held in Willemstad, Curacao, from 2 to 4 April 2012. The meeting was attended by 56 participants from 18 Caribbean countries and four observer organizations (United Nations Development Programme - UNDP, Seismic Research Center - SRC, World Meteorological Organization - WMO and Puerto Rico Seismic Network – PRSN). Main topics discussed during the meeting were the establishment of the Caribbean Tsunami Information Center (CTIC) in Barbados and the plans for the CARIBE WAVE 13 exercise.

The ICG strongly urged Member States to make pledges and provide direct and in-kind contributions for the execution of the CTIC Work Plan activities through: (i) Memoranda of understanding; (ii) Voluntary contributions to the Intergovernmental Oceanographic Commission (IOC) Special Account; and (iii) Support for specific activities.

The ICG approved a CTIC business plan that includes: (i) an annual work plan; (ii) a five-year strategy; (iii) a four-year budget and fund-raising plan; (iv) a partnership strategy; (v) a communications plan; and (vi) an annual report. It noted that the 2012 operational budget of US$ 312,500 is being provided by the project “Enhancing Resilience to Reduce Vulnerability in the Caribbean” coordinated by the UNDP in Barbados and the Organization of Eastern Caribbean States (OECS).

The ICG recognized the challenges of very large tsunamis/earthquakes and the need for integrating the lessons learned from Tohoku Japan Tsunami into the CARIBE EWS with special attention to the detection and reporting of very large magnitude events, and redundancy of website communication systems for focal points of earthquake and tsunami information (Tsunami and Earthquake Centres).

The ICG further recognized the need for additional off-shore tsunami measurements (DART), and the rapid dissemination to the public of the warnings. It further recognized the need for impacts forecast for all areas at risk and that techniques to forecast tsunami duration must also be developed. **It urged** the expansion of DART (Deep-ocean Assessment and Reporting of Tsunamis Project) networks near tsunamigenic sources.

The ICG urged the planning and execution of technical training for seismic and sea-level network operators, as well as the emergency management community on the proper installation, maintenance and usage of instruments. It was suggested to explore opportunities for on-line training in addition to the traditional on-site training.

The ICG recommended conducting a joint CARIBE-WAVE 2013 and LANTEX 2013 exercise in the Western Atlantic, Caribbean and Adjacent Regions on 20 March 2013 and **endorsed** the establishment of a Task Team (TT) to oversee the exercise which includes the ICG Officers, the Technical Secretary of ICG/CARIBE-EWS, the Manager of Caribbean Tsunami Warning Programme (CTWP), the Director of Caribbean Tsunami Information Centre (CTIC), the Director of the International Tsunami Information Centre (ITIC), the Directors of the Pacific Tsunami Warning Center (PTWC) and the West Coast and Alaska Tsunami Warning Center (WCATWC), representatives of the Coordination Centre for the Prevention of Natural Disasters in Central America (CEPREDENAC) and Caribbean Disaster Emergency Management Agency (CDEMA). This Task Team will be chaired by the Manager of the CTWP. **The ICG urged** Member States to establish their own national task teams to determine the scope of their national participation, testing, and objectives.

The ICG further recommended that the new products proposed by the PTWC be tested in a timely manner during the Exercise in addition to the existing products using different mailing lists, and that the products limit themselves to information that would be included in a real event. **It also decided** to collaborate with regional seismic institutions, the Global Earthquake Model (GEM) and the United States Geological Survey (USGS) on the scenario, so as to provide shake maps and intensity estimates for the Caribbean region.

The ICG decided to suggest to the Executive Council of the Intergovernmental Oceanographic Commission (IOC) of UNESCO (United Nations Educational, Scientific and Cultural Organization) that its Area of Responsibility (AOR) be revisited to include all coasts of the western Atlantic not currently covered as part of an Intergovernmental Coordination Group (ICG) or otherwise covered by a tsunami warning centre.

The ICG acknowledged the offer from Trinidad and Tobago and Saint Martin to host the Eight Session of ICG/CARIBE EWS, as well as the offer from Saint Martin and Virgin Islands, United States of America, to host the Ninth Session of ICG/CARIBE EWS in 2014.

The ICG elected by acclamation Ms Christa von Hillebrandt-Andrade (USA) as Chairperson and Mr Philippe Sarron (France), Ms Dawn French (Saint Lucia) and Mr Victor Hugo Cano Pacheco (Bolivarian Republic of Venezuela) as Vice-Chairs of the ICG/CARIBE-EWS for the period 2012–2014.

Résumé exécutif

La septième session du Groupe intergouvernemental de coordination du Système d'alerte aux tsunamis et autres risques côtiers dans la mer des Caraïbes et les régions adjacentes (GIC/CARIBE/EWS-VII) s'est tenue à Willemstad (Curacao) du 2 au 4 avril 2012. Y ont assisté 56 participants de 18 pays de la région et les observateurs de 4 organismes (le Programme des Nations Unies pour le développement (PNUD), le *Seismic Research Centre* (Centre de recherches sismiques, SRC), l'Organisation météorologique mondiale (OMM), le *Puerto Rico seismic network* (Réseau sismique de Puerto Rico, PRSN). Parmi les principales questions examinées à la session figuraient notamment la création, à la Barbade, du Centre d'information sur les tsunamis dans les Caraïbes (CTIC) ainsi que les plans de l'exercice CARIBE WAVE 13.

Le GIC a vigoureusement exhorté les États membres à s'engager à faire des dons et à fournir des contributions directes et en nature aux fins d'exécution des activités relevant du plan de travail du CTIC, par le biais : (i) de mémorandums d'accord, (ii) de contributions volontaires au Compte spécial de la Commission océanographique intergouvernementale (COI) et (iii) d'un soutien à des activités spécifiques.

Le GIC a approuvé le plan d'activité du CTIC, qui comprend : (i) un plan annuel de travail, (ii) une stratégie quinquennale (iii) un budget et un plan de collecte de fonds de quatre ans, (iv) une stratégie de partenariat, (v) un plan de communications et (vi) un rapport annuel. Il a noté que le budget opérationnel de 2012, d'un montant de 312 500 dollars des États-Unis, a été alloué par le Projet *Enhancing Resilience to Reduce Vulnerability in the Caribbean* (Renforcer la résilience afin de réduire la vulnérabilité dans les Caraïbes) coordonné par le PNUD à la Barbade et dans l'Organisation des États des Caraïbes orientales (OECO).

Le GIC a reconnu les dangers des tsunamis et séismes de très grande ampleur, ainsi que la nécessité de prendre en compte les leçons tirées du tsunami du Tohoku (Japon) dans le CARIBE EWS, en accordant une attention particulière à la détermination et à la notification des phénomènes de très forte magnitude, ainsi qu'à la redondance des systèmes de communication Internet à l'intention des points focaux chargés de l'information sur les séismes et les tsunamis (centres sur les tsunamis et les séismes).

Le GIC a également reconnu qu'il était nécessaire de disposer d'un certain nombre de mesures sur les tsunamis effectuées au large (DART, Système d'évaluation et d'enregistrement des tsunamis en mer profonde) et de diffuser rapidement les alertes au sein du public. Il a en outre reconnu la nécessité de prévoir les effets pour l'ensemble des zones à risque et d'élaborer des techniques de prévision de la durée des tsunamis. **Il a vivement encouragé** l'extension des réseaux de bouées DART à proximité des sources tsunamigènes.

Le GIC a instamment demandé la planification et la mise en œuvre de formations techniques destinées aux exploitants des réseaux sismiques et d'observation du niveau de la mer, ainsi qu'aux responsables de la gestion des situations d'urgence, en ce qui concerne l'installation, l'entretien et l'utilisation conformes des instruments. Il a été suggéré d'étudier les possibilités de formation en ligne pour compléter la formation sur place traditionnelle.

Le GIC a recommandé de mener, le 20 mars 2013, un exercice conjoint CARIBE-WAVE 2013 et LANTEX 2013 dans l'Atlantique Ouest, la mer des Caraïbes et les régions adjacentes et **a approuvé** la constitution d'une Équipe spéciale composée de son Bureau, du Secrétaire technique du GIC/CARIBE EWS, du responsable du Programme d'alerte aux tsunamis dans les Caraïbes (CTWP), du Directeur du Centre d'information sur les tsunamis dans les Caraïbes (CTIC), du Directeur du Centre international d'information sur les tsunamis (CIIT), des Directeurs du Centre d'alerte aux tsunamis dans le Pacifique (PTWC) et du Centre

d'alerte aux tsunamis de la côte Ouest et de l'Alaska (WCATWC) et de représentants du Centre de coordination pour la prévention des catastrophes naturelles en Amérique centrale (CEPREDENAC) et de l'Agence caraïbe de gestion d'urgence des catastrophes (CDEMA) pour superviser l'exercice. L'Équipe spéciale sera présidée par le responsable du CTWP. **Le GIC a exhorté** les États membres à établir leurs propres équipes spéciales nationales afin de définir la portée de leur participation, essais et objectifs à l'échelle nationale.

Le GIC a également recommandé que les nouveaux produits proposés par le PTWC soient testés au cours de l'exercice en plus des produits existants, au moment voulu, en utilisant différentes listes de diffusion, et que ces produits se limitent aux informations qu'ils auraient contenues dans le cas d'un événement réel. **Il a aussi décidé** de collaborer au scénario avec des institutions sismiques régionales, le *Global Earthquake Model* ou GEM (modèle mondial de séisme) et l'USGS, de manière à fournir des cartes des secousses et des estimations de l'intensité pour la région des Caraïbes.

Le GIC a décidé de suggérer au Conseil exécutif de la Commission océanographique intergouvernementale (COI) de l'UNESCO de redéfinir sa zone de responsabilité de façon à ce qu'elle comprenne l'ensemble des côtes de l'Atlantique Ouest qui ne relèvent actuellement d'aucun GIC ni d'aucun centre d'alerte aux tsunamis.

Le GIC a pris acte de l'offre de Trinité-et-Tobago et Saint-Martin d'accueillir la huitième session du GIC/CARIBE EWS, ainsi que de l'offre de Saint-Martin et des Îles Vierges américaines d'accueillir la neuvième session du GIC/CARIBE EWS en 2014.

Le GIC a élu par acclamation Mme Christina von Hillebrandt-Andrade (États-Unis) à sa présidence et M. Philippe Sarron (France), Mme Dawn French (Sainte-Lucie) et M. Victor Hugo Cano Pacheco (République bolivarienne du Venezuela) aux postes de vice-présidents pour 2012–2014.

Resumen dispositivo

La Séptima reunión del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes (GIC/CARIBE EWS-VII) se celebró en Willemstad (Curacao) del 2 al 4 de abril de 2012. A la reunión asistieron 56 participantes de 18 países caribeños y cuatro organizaciones observadoras (el Programa de las Naciones Unidas para el Desarrollo (PNUD), *Seismic Research Center* (SRC), la Organización Meteorológica Mundial (OMM) y la Red Sísmica de Puerto Rico (PRSN)). Los debates de la reunión se centraron principalmente en la creación del Centro de Información sobre los Tsunamis en el Caribe (CTIC) en Barbados y la planificación del ejercicio CARIBE WAVE 2013.

El Grupo Intergubernamental de Coordinación (GIC) instó firmemente a los Estados Miembros a que asumieran compromisos e hicieran contribuciones directas y en especie en favor de la ejecución de las actividades del plan de trabajo del CTIC, mediante: i) memorandos de entendimiento; ii) contribuciones voluntarias a la Cuenta Especial de la Comisión Oceanográfica Intergubernamental (COI); y iii) respaldo a actividades específicas.

El GIC aprobó un plan institucional del CTIC que comprende: i) un plan de trabajo anual; ii) una estrategia quinquenal; iii) un presupuesto cuatrienal y un plan de recaudación de fondos; iv) una estrategia de colaboración; v) un plan de comunicaciones; y vi) un informe anual. Señaló que el presupuesto operativo de 2012, de una cuantía de 312.500 dólares estadounidenses, provenía del proyecto "*Enhancing Resilience to Reduce Vulnerability in the Caribbean*" (Aumentar la capacidad de recuperación para reducir la vulnerabilidad en el Caribe), coordinado por el PNUD en Barbados y los países de la Organización de los Estados del Caribe Oriental (OECO).

El GIC reconoció los desafíos que representan los tsunamis/terremotos de gran magnitud y la necesidad de incorporar las enseñanzas extraídas del tsunami de Tohoku (Japón) en el Sistema de Alerta contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes (CARIBE-EWS), brindando una atención particular a la determinación de las características de fenómenos de gran magnitud y la difusión de información al respecto, y a la redundancia de los sistemas de comunicación basados en la web para los puntos focales de información sobre terremotos y tsunamis (centros de alerta de tsunamis y terremotos).

El GIC reconoció asimismo la necesidad de un cierto número de estaciones de detección de tsunamis en alta mar (DART) y la rápida difusión al público de las alertas. Reconoció además la necesidad de prever las repercusiones en todas las zonas en situación de riesgo, y de elaborar también técnicas para predecir la duración de los tsunamis. **Instó** a que se ampliaran las redes de boyas DART cerca de las fuentes tsunamigénicas.

El GIC alentó a que se diseñara e impartiera formación técnica dirigida a operadores de las redes de estaciones sismológicas y de medición del nivel del mar, así como a la comunidad de gestión de emergencias, sobre la instalación, el mantenimiento y la utilización correctos de los instrumentos. Se sugirió estudiar opciones como la formación en línea, además de la formación tradicional *in situ*.

El GIC recomendó que se realizara el ejercicio CARIBE WAVE 2013 junto con el ejercicio LANTEX 2013 en el Atlántico Occidental, el Caribe y las regiones adyacentes el 20 de marzo de 2013, y **aprobó** la creación de un equipo de trabajo compuesto por la Mesa del GIC, el Secretario Técnico del GIC/CARIBE EWS, el Administrador del Programa de Alerta contra los Tsunamis en el Caribe (CTWP), el Director del Centro de Información sobre los Tsunamis en el Caribe (CTIC), el Director del Centro Internacional de Información sobre los Tsunamis (ITIC), los Directores del Centro de Alerta contra los Tsunamis en el Pacífico (PTWC) y el

Centro de Alerta contra los Tsunamis de Alaska y la Costa Occidental (WCATWC), y representantes del Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC) y el Organismo del Caribe para la Gestión de Emergencias en Casos de Desastre (CDEMA), para supervisar el ejercicio. Este equipo de trabajo será presidido por el Administrador del CTWP. **El GIC instó** a los Estados Miembros a crear sus propios equipos de trabajo nacionales para determinar el alcance de la participación, las pruebas y los objetivos de sus países.

El GIC recomendó asimismo que, además de los productos existentes, durante el ejercicio se pusieran a prueba los nuevos productos propuestos por el PTWC, en el momento oportuno y utilizando distintas listas de destinatarios, y que los productos comprendieran únicamente la información que se incluiría en un suceso real. **Decidió asimismo** colaborar con instituciones sismológicas regionales, el *Global Earthquake Model* (GEM) y el Servicio Geológico de los Estados Unidos de América (USGS) en la formulación del guión del ejercicio, a fin de elaborar mapas de movimiento sísmico y estimaciones de la intensidad para la región del Caribe.

El GIC decidió sugerir al Consejo Ejecutivo de la Comisión Oceanográfica Intergubernamental (COI) de la UNESCO que redefiniera su ámbito de responsabilidad, para incluir todas las costas del Atlántico Occidental que actualmente no entran en el ámbito de un GIC o de un centro de alerta contra los tsunamis.

El GIC agradeció la propuesta de Trinidad y Tobago y San Martín de acoger la Octava reunión del GIC/CARIBE EWS, así como la de Sint Maarten y las Islas Vírgenes de los Estados Unidos de América de acoger la Novena reunión del GIC/CARIBE EWS en 2014.

El GIC eligió por aclamación a la Sra. Christa von Hillebrandt-Andrade (Estados Unidos de América) Presidenta y al Sr. Philippe Sarron (Francia), la Sra. Dawn French (Santa Lucía) y el Sr. Victor Hugo Cano Pacheco (República Bolivariana de Venezuela) Vicepresidentes del GIC/CARIBE EWS para el periodo 2012–2014.

Рабочее резюме

Седьмая сессия Межправительственной координационной группы по Системе предупреждения о цунами и других опасных явлениях в прибрежных районах Карибского бассейна и прилегающих регионов (МКГ/КАРИБ-СРП-VII) была проведена в Виллемстаде, Кюрасао, 2-4 апреля 2012 г. На совещании присутствовали 56 участников из 18 стран Карибского региона и представители четырех организаций-наблюдателей (Программа развития Организации Объединенных Наций – ПРООН, Центр сейсмических исследований – ЦСИ, Всемирная метеорологическая организация – ВМО и Сейсмическая сеть Пуэрто-Рико – PRSN). Главными темами обсуждений на совещании было создание Карибского центра информации о цунами (КЦИЦ) в Барбадосе и планы учений «Карибская волна – 2013».

МКГ настоятельно призвала государства-членов объявлять о своих обязательствах и вносить прямые взносы и вклад натурой для выполнения мероприятий, включенных в План работы КЦИЦ, с помощью: (i) меморандумов о взаимопонимании; (ii) добровольных взносов на Специальный счет МОК (Межправительственная океанографическая комиссия); и (iii) поддержки конкретных мероприятий.

МКГ одобрила бизнес-план КЦИЦ, который включает: (i) годовой план работы; (ii) пятилетнюю стратегию; (iii) четырехлетний бюджет и план мобилизации средств; (iv) стратегию партнерства; (v) план коммуникаций и (vi) годовой отчет. Она отметила, что оперативный бюджет на 2012 г. в размере 312 500 долл. обеспечивается в рамках проекта «Повышение устойчивости для уменьшения уязвимости в Карибском бассейне», который координируется ПРООН в Барбадосе и ОВКГ (Организация восточнокарибских государств).

МКГ признала проблемы и задачи, связанные с очень крупными цунами/землетрясениями, и необходимость учета в рамках КАРИБ-СРП того опыта, который был получен в ходе цунами Тохоку в Японии, с уделением особого внимания выявлению очень крупномасштабных явлений и распространению соответствующих сообщений, а также обеспечению резервных коммуникационных систем веб-сайтов для координационных центров информации о землетрясениях и цунами (Центров по цунами и землетрясениям).

МКГ далее признала потребность в некоторых оффшорных измерениях цунами (Глубоководная система обнаружения и оповещения о цунами - ГСООЦ) и в быстром распространении предупреждений среди населения. Она также признала необходимость прогнозирования последствий для всех подвергающихся опасности районов, а также разработки методов прогнозирования продолжительности цунами. Она **настоятельно призвала** к расширению сетей ГСООЦ вблизи цунамигенных очагов.

МКГ настоятельно призвала обеспечить планирование и осуществление технической подготовки для операторов сетей наблюдения за сейсмичностью и уровнем моря, а также для специалистов по управлению чрезвычайными ситуациями касательно надлежащей установки, обслуживания и использования инструментов. Было предложено изучить альтернативы для онлайнового обучения в дополнение к традиционной подготовке на местах.

МКГ рекомендовала провести 20 марта 2013 г. совместные ученья «Карибская вол-на – 2013» и «ЛАНТЕКС – 2013» в Западной Атлантике, Карибском бассейне и прилегающих регионах и **одобрила** создание Целевой группы для контроля за учениями в составе должностных лиц МКГ, технического секретаря МКГ/КАРИБ-СРП, руководителя Карибской программы предупреждения о цунами (КППЦ), директора

КЦИЦ, директора ИТИК, директора ЦПЦТО и ЗПАЦПЦ и представителей СЕПРЕДЕНАК и КДЕМА. Эта Целевая группа будет работать под председательством руководителя КППЦ. **МКГ настоятельно призвала** государства-членов создавать свои собственные национальные целевые группы для определения рамок их национального участия, методов тестирования и соответствующих целей.

МКГ далее рекомендовала своевременно опробовать в ходе учений новые продукты, предложенные ЦПЦТО, в дополнение к существующим продуктам, с использованием различных списков рассылки, и ограничить содержание продуктов информацией, которая будет включена в рамках реального события. **Она постановила также** обеспечить сотрудничество в рамках мероприятий региональных сейсмических учреждений, Глобальной модели землетрясений (ГМЗ) и ЮСГС касательно соответствующего сценария, с тем чтобы подготовить карты колебаний и оценки их интенсивности для Карибского региона.

МКГ решила предложить Исполнительному совету МОК пересмотреть ее сферу ответственности (СО), с тем чтобы в нее было включено все побережье Западной Атлантики, которое в настоящее время не относится к области компетенции МКГ или не охвачено каким-либо центром предупреждения о цунами.

МКГ подтвердила получение приглашения от Тринидада и Тобаго и Сент-Мартена провести восьмую сессию МКГ/КАРИБ-СРП, а также предложения от Сент-Мартена и Виргинских островов (США) о проведении девятой сессии МКГ/КАРИБ-СРП в 2014 г.

МКГ избрала путем аккламации г-жу Кристу фон Хиллебрандт-Андраде (США) Председателем, а г-на Филиппа Саррона (Франция), г-жу Дон Френч (Сент-Люсия) и г-на Виктора Уго Кано Пачеко (Боливарианская Республика Венесуэла) - заместителями Председателя МКГ/КАРИБ-СРП на период 2012–2014 гг.

1. WELCOME AND OPENING OF SESSION

1 The Seventh Session of the IOC Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-VII) was held at the Avila Beach Hotel, Willemstad, Curacao, from 2 to 4 April 2012.

2 The Session was opened on Monday, 2 April 2012 under the Chairship of Ms Lorna Inniss (Barbados), Chair of the ICG/CARIBE-EWS.

3 Mr Albert Martis, Director of the Meteorological Department of Curacao, welcomed all the participants by recalling that after the lessons learned from the 2004 Indian Ocean tsunami, several Intergovernmental Coordination Groups (ICGs) were established around the world to provide resourceful assistance on tsunami risk reduction, including to Member States in the Caribbean Region, in accordance with IOC Resolution XXIII-13 (IOC-XXIII/3). He expressed his pleasure to be the host of the Seventh Session of the ICG in Curacao, and emphasized the great expertise that is made available through the ICG delegates.

4 Mr Martis stated that since a tsunami may impact the whole region, cooperation among countries is crucial to establish regional observing networks, share data among countries, and facilitate active information exchange of best practices and technical assistance. Challenges must be overcome and we should take advantage of opportunities. He highlighted the example of the World Meteorological Organization (WMO) that has propelled great advances in meteorology in the past few decades. This is the case as well for the tsunami community. He finished his intervention by encouraging participants to continue their tasks with the same passion for protection of life.

5 Mr Bernardo Aliaga, Technical Secretary of the ICG/CARIBE-EWS, agreed that energy and passion for protecting life is what characterizes ICG. He noted the importance of the participation of French speaking countries as Haiti and France. Mr Aliaga congratulated Spanish speaking countries including Colombia and Dominican Republic for their effective integration into the process of reinforcing tsunami risk reduction in the Caribbean communities. He regretted the absence of participants from Central America but reported that the integration of this region should be reinforced by mid-2012. Mr Aliaga thanked the colleagues from Curacao for the organization of the meeting.

6 Ms Lorna Inniss, Chair of the ICG/CARIBE-EWS, thanked the Government for agreeing to host the ICG meeting in Curacao. She stated that ICG/CARIBE-EWS is in a very important phase of its development and that challenges across the globe are increasingly impacting the work of the ICG in developing a tsunami warning system. She recognized the effort of the Tsunami Unit of the IOC/UNESCO, especially Mr Thorkild Aarup and the ICG/CARIBE-EWS Technical Secretary, Mr Bernardo Aliaga, for their dedication under the most trying of circumstances. Ms Inniss praised the significant accomplishments over the last six and a half years since the very first ICG session held in Barbados in 2006. She recalled the uncertainty expressed by many colleagues across the region considering financial limitations on an ambitious programme. However, she noted that, even if in some cases the advancements have been slow and incremental, progress of development has never ceased.

7 As particular examples, Ms Inniss noted the success of the first ever tsunami simulation exercise across the entire basin, and the first ever non-US joint IOC-NWS (National Weather Service of NOAA) TsunamiReady recognition that was conferred on the British Caribbean Territory of Anguilla on December 2011. In addition, she mentioned the important and timely Japan/UNESCO/UNU International Symposium (on) *The Great East*

Japan Tsunami and Tsunami Warning Systems: Policy Perspectives; Summary statements (IOC/BRO/2012/1) held on 16 and 17 February 2012 in Tokyo.

8 As outgoing Chairperson, and on behalf of her country, Barbados, Ms Inniss thanked the ICG for overcoming challenges to building national and regional warning systems, strengthening regional capacity to understand the scale of the task before us, fostering the spirit of collaboration developed among politically, culturally and economically diverse Member States, especially for those willing to give above and beyond their share to contribute to the system's architecture for the greater good of the region.

9 On behalf of the Government of Curacao and himself, the Minister of Traffic, Transport and Urban Planning welcomed the participants to Curacao and to the meeting. He recalled that after the tsunami event in the Indian Ocean in 2004 that killed about 240,000 people, it became clear that great effort has to be made to increase the awareness of this natural phenomenon and to reduce both the human fatalities and property losses. He recalled other devastating tsunamis around the world and that the devastating earthquake with a magnitude of 7 in Haiti in 2010. A local tsunami warning was issued in Haiti, strongly reminding everyone that a tsunami event is also possible in the Caribbean. He expressed pleasure with the advances that have been reached in the region by focusing on protection of life and property and noted that cooperation among nations will bring new opportunities for all countries. Finally, he congratulated IOC/UNESCO for its leadership and ICG members for all their efforts on tsunami risk reduction.

2. ORGANIZATION OF THE SESSION

2.1 ADOPTION OF THE AGENDA

10 The Chairperson informed the Plenary that the agenda was prepared by the Secretariat and the Officers taking into account the Recommendations and instructions given at the Sixth Session of the ICG/CARIBE-EWS, as well as the relevant parts of the IOC Rules of Procedures.

11 The agenda **was approved** without changes. The agenda of the Session is available in ANNEX I. The list of participants is available in ANNEX VI to this report.

2.2 DESIGNATION OF THE RAPPORTEUR

12 The Chairperson requested Delegates to propose candidates for Rapporteur of the meeting. As customary at the ICG/CARIBE-EWS meetings, it was requested to choose one rapporteur for each of the three languages of the meeting (English, French and Spanish).

13 United States, France and Dominican Republic were proposed as rapporteurs.

14 The Chair informed the Session that, as per established practices for subsidiary bodies, only of the Decisions and Recommendations receive a line by line approval of the report.

15 **The ICG approved** the proposals and thanked the United States, France and Dominican Republic for providing rapporteurs.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

16 The Chairperson noted that interpretation was available in French, English and Spanish. She informed the Plenary that in order to facilitate the proceedings of the meeting a timetable had been prepared by the Secretariat in coordination with the Officers and the

local organizing committee. At this point, she offered the floor to the local host to provide logistic details above the welcome dinner and the field trip to Banda Abou, Curacao.

17 The timetable **was approved** without changes.

18 In order to smooth the work of the session and facilitate the generation of recommendations and agreements the plenary **decided** to set up three intra-sessionnal Working Groups (WG) to address some of the major issues to be discussed at the meeting. The intra-sessional WG were established as follows:

- Caribbean Tsunami Information Centre
- CARIBE WAVE 2013
- Election committee formed by Curacao, France and United States.

19 In addition, United States proposed an informal meeting of Working Group IV.

3. REPORT ON INTERSESSIONAL ACTIVITIES

3.1 REPORT BY THE EXECUTIVE SECRETARY OF THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC)

20 The Technical Secretary for ICG/CARIBE EWS, Mr Bernardo Aliaga, presented the report of the Executive Secretary and briefly reported on actions led or coordinated by the Secretariat in 2011−2012.

21 Mr Aliaga reported that the new regional advisory service provided by the Regional Tsunami Service Providers (RTSPs) of Australia, India and Indonesia became operational on 12 October 2011 opening in a new phase of regional cooperation for tsunami warning in the Indian Ocean.

22 In addition, he mentioned the Japan/UNESCO/UNU International Symposium (on) The Great East Japan Tsunami and Tsunami Warning Systems: Policy Perspectives; Summary statements held on 16 and 17 February 2012 in Tokyo, Japan. He noted that the Vice-Chair of the Working Group on Tsunamis and Other Hazards Related to Sea Level Warning and Mitigation Systems (TOWS-WG), Mr Yukata Michida, would deliver a presentation on this symposium and a summary on the main discussions and decision of the Fifth Session of the Working Group on Tsunamis and Other Hazards Related to Sea Level Warning and Mitigation Systems (IOC/TOWS-WG-V/3), held on 15 February 2012, in Tokyo, Japan.

23 Moreover, Mr Aliaga informed that the UNESCO Director General, Ms Irina Bokova, has approved emergency funding for the activities of the ICG/CARIBE-EWS in view of the importance of this activity for Member States and the impact of the reductions on the available regular budget for the ICG.

24 The Chair congratulated Mr Aliaga for his presentation and noted the usefulness of sharing the experience of the Japan/UNESCO/UNU International Symposium to enhance tsunami awareness at local level.

25 **The ICG noted** the report of the Executive Secretary.

3.2 REPORT BY THE CHAIRPERSON

26 The Chairperson of ICG/CARIBE EWS presented the report of the Chairperson indicating that the Board have been communicating more through teleconferencing during the reporting period. She recommended that the use of Webinars for the conduct of business be encouraged.

27 Ms Inniss stated that the Chairperson, as well as Vice Chairs, continued to represent the ICG at global and regional levels, assisted the Secretariat in the identification of funding opportunities, and promoted the activities of the ICG, as well as the progress of the system. The Board sought synergies with other programmes in order to achieve the objectives set.

28 The Chairperson participated in the Fifth Session of the of the Working Group on Tsunamis and Other Hazards Related to Sea Level Warning and Mitigation Systems (IOC/TOWS-WG-V/3) hosted by the Government of Japan in conjunction with the Japan/UNESCO/UNU International Symposium on The Great East Japan Tsunami and Tsunami Warning Systems: Policy Perspectives; Summary statements. Ms Inniss stressed the usefulness of the Japan/UNESCO/UNU International Symposium.

29 The Chairperson also presented a report on the Sixth Session of the ICG/CARIBE-EWS (ICG/CARIBE EWS-VI/3) at the Twenty-sixth Session of the IOC Assembly (IOC-XXVI/3) held in Paris, France, from the 22 June to 5 July 2011. IOC Member States responded with a strong show of support for the ICG. This support was further strengthened during deliberations at the UNESCO's 36th General Conference held from 25 October to 10 November 2011. She indicated that she did not attend the IOC Forty-fifth Session of the Executive Council (IOC/EC-XLV/3) held in Paris, France, from 26 to 28 June 2012.

30 **The ICG noted** the report of the Chairperson.

3.3 REPORT BY THE ICG/CARIBE-EWS SECRETARIAT

31 The Technical Secretary for ICG/CARIBE-EWS, Mr Bernardo Aliaga, presented the report of the Secretariat and briefly addressed the progress in fulfilling the recommendations agreed by the ICG at previous meetings.

32 Mr Aliaga informed that funding for sea-level network has been secured from Monaco, St Vincent and the Grenadines, Brazil and the United States of America. In this regard, site studies for Nicaragua, Guatemala, Cayman Islands, St Vincent & the Grenadines, St Kitts & Nevis, have been identified in coordination with the Puerto Rico Seismic Network (PRSN) and Tsunami Warning Focal Points (TWFPs)/Tsunami National Contacts (TNCs).

33 Moreover, Mr Aliaga reported that the ICG/CARIBE-EWS Secretariat has contributed to the pilot TsunamiReady experience (Anguilla, UK) and to launch of the Caribbean Tsunami Information Centre (CTIC). In addition, the Secretariat provided SOP (Standard Operating Procedures) training in Nicaragua and Haiti and provided Secretariat support on request.

34 Regarding fundraising efforts, the Secretariat secured support for CTIC's regular budget from the UNESCO Emergency Fund and presented project proposals for Haiti (ACP-EU Natural Disaster Risk Reduction Programme funded by the European Union and managed by GFDRR—Global facility for Disaster Reduction and Recovery— presented in February 2012), for Central America (DIPECHO—Disaster Preparedness ECHO— presented 30 March 2012) and for CTIC (ACP-EU Natural Disaster Risk Reduction Program funded by the European Union and managed by GFDRR presented in February 2012).

35 The Chair asked for clarification on the current state of TNCs and TWFPs. Mr Aliaga recalled that the list of TNCs and TWFPs is officially available at the IOC Tsunami website (password protected section) and is regularly updated. Mr Aliaga indicated that changes in the name of the contact persons can be sent directly to the ICG/CARIBE-EWS Secretariat, while changes in the contact organizations should be communicated through diplomatic channels from the Ministry of Foreign Affairs, National Commission for UNESCO or Permanent Delegations at UNESCO.

36 Bermuda inquired how many Member States have TWFPs that also have responsibility for meteorological services. ICG/CARIBE-EWS Vice-chair, Ms Christa von Hillebrandt Andrade, informed that is estimated that out of 35 Member States, 15 TWFP are meteorological offices and 20 are not.

37 Bermuda expressed surprise on the fact that not more meteorological offices act as TWFP and encouraged Member States to strengthen cooperation with meteorological services considering that the communication infrastructure used for tsunami warning is the same as for warning related to hydro-meteorological events. It was clarified that some Member States do not have meteorological services or that those do not work 24/7. Bermuda insisted that TWFPs should enhance cooperation with meteorological services even if those are not 24/7.

38 ICG/CARIBE-EWS Secretariat reported enhanced efforts to forge cooperation with the Caribbean Institute for Meteorology and Hydrology (CIMH) to improving training and capacity building. In this respect, the Chair recalled that CIMH is about to be designated a regional Climate Research Centre.

39 Vice-chair Christa von Hillebrandt Andrade recalled that some seismic monitoring offices are TWFP since they operate 24/7 and because of the relevance of seismic information for tsunami warning. She noted that each country should identify the most effective way to receive warnings.

40 **The ICG noted** the report of the ICG/CARIBE-EWS Secretariat.

3.4 REPORT OF THE CARIBBEAN TSUNAMI INFORMATION CENTER (CTIC)

41 The Chairperson opened this item by recalling Delegates that the Fourth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-IV), held in Fort-de-France, Martinique, from 2 to 4 June 2009 recommended that Member States identify funding for CTIC activities within their annual regular budgets (Recommendation ICG/CARIBE EWS IV.6) and that Member States agreed at the Sixth Session of the ICG/CARIBE EWS to address the issue of Member States financial contributions to the CTIC during this session. She highlighted the establishment of CTIC thanks to a three-year funding agreement between United Nations Development Programme (UNDP) Barbados & the OECS, and the Government of Italy, under the framework of the project “Enhancing Resilience to Reduce Vulnerability in the Caribbean” (ERC).

42 Ms Alison Brome, consultant for the CTIC establishment, reported on the process to establish the CTIC from interim to permanent status. During its interim phase CTIC was based at the Coastal Zone Management Unit (CZMU) of Barbados. In its current phase, it is located within the Department of Emergency Management (DEM) of Barbados. Ms Brome recalled that approximately US$ 556,000 will be allocated for CTIC establishment through the ERC Project. The Caribbean Tsunami Information Centre is planned to be established by 30 June 2012. The Draft CTIC Business Plan 2012–2016, and Draft Terms of Reference for

the Caribbean Tsunami Information Centre Board (ANNEX III) were developed to be discussed and approved by the ICG at its present Seventh Session.

43 The Draft CTIC Business Plan 2012–2016 was a key Recommendation of ICG/CARIBE EWS-VI and encompasses: the (a) Five-Year Strategy 2012–2016; (b) Five-Year Budget and Resource Mobilization Plan; (c) Annual Work Plan; (d) Partnership Strategy; (e) Communications Plan; and (f) Annual Report.

44 Ms Brome noted that CTIC will implement communication and dissemination of warning information and Public Awareness and Education (PAE) initiatives first, and then will contribute in the area of hazard assessment and monitoring and detection.

45 She indicated that for 2012, the CTIC activities included in the workplan are:

- Basic tsunami training for TWFPs and first responders through Interim CTIC & ITIC joint programming.
- Support for participation of ICG/CARIBE-EWS Member States in ICG/CARIBE EWS Working Group and ICG plenary meetings.
- Finalisation of tsunami education strategies at regional and national levels.
- Support for education and awareness efforts in schools.
- Development and distribution of culturally appropriate PAE materials.
- Development of partnership agreements with regional centres.
- Execution of training programmes for key operators with responsibilities within the national warning systems.
- Execution of training for TWFPs is: SOPs and communications protocols, including exercises.
- Initiation of a regional tsunami mitigation recognition programme for the ICG/CARIBE-EWS.
- Develop an Annual Workplan for 2013.

46 In addition, Ms Brome presented the components of the Draft Caribbean Tsunami Information Centre (CTIC) Board Terms of Reference. (ANNEX III).

47 Saint Lucia stressed that funding for CTIC should come from Member States and recommended that Member States establish a formula taking into account diplomatic channels in order to obtain annual allocations to CTIC in the same way as funding is allocated to seismic centres in the region.

48 Haiti emphasized the importance that CTIC should maintain contact with other information centres and with all Member States. In this respect, the Chair encouraged Member States to find mechanisms to ensure that language differences are addressed at the CTIC. He recalled that the interim board has only functioned in English.

49 United States of America encouraged CTIC to facilitate language and cultural sensitivity in its work. In addition, the US noted that while financial support is not possible for the moment, options are being analysed to continue to achieve the tsunami goals and objectives, essential to all Member States in the region.

50 France, specifically the General Counsellor of Martinique, expressed willingness to support CTIC through partnerships with universities to put students at the service of CTIC.

Moreover, a space could be dedicated at the “Centre de Découverte des Sciences de la Terre” in Martinique for a permanent exposition on tsunami issues as contribution to CTIC.

51 Sint Marteen stressed that once Member States identify the benefits offered by CTIC; the establishment of a fee for participation if properly requested should not be an issue. The fee could be determined relative to the size of the country. Sint Marteen expressed its willingness to actively participate but noted that difficulties arise when benefit does not go directly to a country.

52 The Chair encouraged participants to facilitate translation of public awareness and education materials for CTIC. Sint Marteen clarified that translation into Dutch would not be necessary as the majority of the population in Netherlands territories speak English.

53 Curacao offered support with translation since several languages are spoken in the island.

54 Saint Lucia and the United States Virgin Islands congratulated Barbados for hosting the interim CTIC Board. In this respect, Barbados reiterated its commitment to continue supporting the CTIC.

55 Puerto Rico Seismic Network (PRSN) recommended that CTIC establish partnerships with hotel chains and cruise lines.

56 An intra-sessional Working Group revised the Draft CTIC Business Plan 2012–2016 and the Draft CTIC Board Terms of Reference (TOR).

57 **The ICG decided** to nominate to the Board of CTIC a representative of Curacao Mr Albert Martis, Director of Meteorological Department of Curacao; and the Chair of Working Group IV, Mr Kerry Hinds, from Barbados.

58 **The ICG adopted** Recommendation ICG/CARIBE EWS-VII.2.

3.5 REPORTS FROM UNITED NATIONS AND NON UNITED NATIONS ORGANISATIONS

59 Mark Guishard, Director of the Bermuda Weather Service, reported on recent changes concerning the Global Telecommunication System (GTS) of the World Meteorological Organization (WMO). He stated that there is a serious concern regarding the ability of Meteorological Services to maintain continuity of communications via the Global Telecommunications System, in light of some recent workstation vendor quotes for upgrades. A summary of the current understanding follows:

- The GTS services are being migrated to two separate Internet File Services (WIFS and GIFS respectively) – the internal deadline for migration has passed, and the regional GTS satellite service will be terminated at the end of June 2012.
- WIFS (World Area Forecast System Internet File Service) will be the medium through which the basic weather products in support of aviation will be transmitted and received. This does not necessarily include Tsunami Messages, and will be available at little or no cost to the Meteorological Services.
- GIFS (GTS Internet File Service) will accommodate a wider suite of products, which do include tsunami messages.

- One vendor (MORCOM) has recently quoted approximately US$ 5,000 to certain client Meteorological Services for a patch that will allow provision of the WIFS and GIFS data only to the existing workstation (Corobor). Another quote of approximately US$ 35,000 to upgrade the entire system to accommodate the additional products, including plotting functionality and graphical product creation, unrelated to the tsunami warning system, but vital to the on-going level of service to the Meteorological Services. Given the economic climate, there is concern about this recently revealed cost to provide the basic services to support aviation weather and tsunami warning efforts, and also the greater cost to support the existing level of service. Countries affected include (but are not limited to) Barbados, and Trinidad and Tobago.

60 Whilst there is some reassurance that the lower quote will accommodate the needs of the tsunami warning system for the affected Member States' Meteorological Services, the wider issue of continuity of Meteorological Service (including tsunami warning reception and transmission capability) would be discussed at the upcoming thirty-fourth session of the RA IV Hurricane Committee of WMO in Ponte Vedra Beach, Florida, United States of America, from 11 to 15 April 2012.

61 Sint Maarten expressed concern on how to explain these important changes to disasters managers.

62 The United States of America recalled that all the information available through GTS is provided by the Emergency Managers Weather Information Network (EMWIN) but EMWIN is a one-way communication. In addition, EMWIN can be programmed regarding the hazards that are important for the user, who can be notified if something happen in the region.

63 France inquired about the reason for the change from satellite to internet system and expressed concern for the loss of Internet communication, particularly in cases of major events.

64 The Chairperson stressed the importance of discussing the transition from GTS to the new system especially considering that ICG had decided that GTS is the main means for warning transmission.

65 Barbados requested clarification about the cost of the new system since they have information that it costs US$ 30,000. To this request, Ms Elizabeth Klute, Chair (a.i) of Working Group 3, volunteered to request further clarification about these matters and report back to Member States.

66 Ms Carolina Hincapié-Cárdenas presented the Tsunami Programme of Puerto Rico, which actively participates at the National Tsunami Hazard Mitigation Program (NTHMP). Ms Hincapié presented all the components of this programme including the improvement of existing tsunami inundation and evacuation maps, the support to communities for the elaboration of response plans and public awareness campaigns.

3.6 STATUS OF OTHER ICGs

67 The Vice-chair of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Mr Yukata Michida, delivered a presentation on the Japan/UNESCO/UNU International Symposium on The Great East Japan Tsunami and Tsunami Warning Systems: Policy Perspectives; Summary statements held on 16 and 17 February 2012 in Tokyo, Japan. He also summarized the main discussions and decisions of the Fifth Session of the Working Group on Tsunamis and Other

Hazards Related to Sea-level Warning and Mitigation Systems (IOC/TOWS-WG-V), held on 15 February 2012, in Tokyo, Japan.

68 Mr Bernardo Aliaga reported on ICG/PTWS activities highlighting the most recent development of a project proposal presented to DIPECHO on tsunami preparedness in Central America, including production of hazard maps, training on Standard Operating Procedures (SOPs), and community preparedness for tsunami.

69 The Head of the US Delegation, Mr Bill Proenza, delivered a Powerpoint presentation on the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS) of the Intergovernmental Oceanographic Commission of UNESCO, established during the Twenty-third Session of the IOC Assembly (Paris, France, 21–30 June 2005, IOC-XXIII/3).

70 Mr Proenza stated that ICG/NEAMTWS is the vital ICG basin partner for the eastern Atlantic Basin including the Mediterranean. His presentation began with a geographical depiction of tsunami sources in the NEAM (North-eastern Atlantic, the Mediterranean and connected seas) region and the list of the 39 NEAM Member States, plus the 9 Observer Member States as of ICG/NEAMTWS-VIII (Santander, Spain, 22–24 November 2011).

71 Mr Proenza informed that the Ninth session of the ICG/NEAMTWS will take place from 11 to 14 September 2012 in Southampton, England. He explained that the NEAMTWS has four Working Groups and a Task Team on Communications Test and Tsunami Exercises.

72 The Head of the US Delegation mentioned that at the last meeting in Santander, the NEAMTWS Member States endorsed the concept of Tsunami Watch Providers (TWPs) Tsunami Watch Recipients (TWR), in which TWPs disseminate information without geographical constraint and Tsunami Watch Recipients are able to receive information from one or more TWPs of their choice. NEAMTWS Member States also decided to conduct an Enlarged Communication Test Exercise (ECTE) in May 2012 followed by the first Tsunami Exercise in the NEAM region, NEAM Wave12, the third week of November 2012.

73 **The ICG recognized** the importance of the Tsunami Information Centre for the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTIC) formally established at the IOC Secretariat on 1 January 2011 with the financial support of the European Commission's Humanitarian Aid Office (ECHO).

74 Mr Proenza further recalled that NEAMTWS also has an active Steering Committee coordinating and integrating during its inter-sessional periods by correspondence and with coordination meetings prior to each ICG session. It is composed of the chair and Vice-chairs, and the Co-chairs of the Working Groups and Task Team. Mr Proenza remarked that it was very important to have the two ICGs of the Atlantic Basin and its adjoining sub-basins coordinating on their operational and organizational functions and requirements. This statement resonated very well with the ICG/CARIBE-EWS Member States.

3.7 NATIONAL PROGRESS REPORTS

75 Delegates made short presentations on main actions and status of their national tsunami and other coastal hazards warning systems. Anguilla (UK), Barbados, British Virgin Islands (UK), Colombia, Dominican Republic, France, Haiti, Saint Lucia, St Kitts & Nevis, Trinidad & Tobago, and the United States of America, presented National Reports.

76 The US Delegation presented the National Report on its tsunami program developments, highlighting:

- Warning: Continued US Pacific Tsunami Warning Center interim tsunami monitoring services for the entire international membership of the UNESCO IOC/ICG-CARIBE-EWS region.
- Tests: Monthly communications tests, the annual regional exercises (LANTEX 2012 and LANTEX/CARIBE WAVE 2013).
- Communications: The expanded availability of the highly valued and cost gentle EMWIN service on the internet and support to the successful Community Model Interface for Tsunami (ComMIT) workshop held in October 2011, in Guadeloupe, France.
- Education and Preparedness: Expanded US TsunamiReady Communities both domestically and internationally (20 in Puerto Rico, and soon the entire United States Virgin Islands) and in Anguilla (first non US community/nation outside the USA to be declared TsunamiReady©); and improved regional education and outreach and awareness including through the Caribbean training modules by the Cooperative Program for Operational Meteorology, Education and Training (COMET).

77 The US Virgin Islands informed that all its communities are Tsunami Ready©. As part of the US presentation, a video about the Caribbean Tsunami Early Warning System produced in English, French and Spanish was made available to all delegates

78 Saint Lucia reported on participation in the Exercise Caribe Wave 11 (IOC/2010/TS/93 Rev.) and on developments on establishing warning procedures. In addition, tsunami public awareness materials in Spanish (provided by ONAMET) and in French (Tsunami Smart Poster) have been used in schools to promote tsunami preparedness. In collaboration with the Australian Government Overseas Aid Program (AusAID) and the Caribbean Disaster Emergency Management Agency (CDEMA), Public Service Announcement (PSA) was distributed to 19 radio stations and 11 television stations. The PSA addressed the English and Creole needs of the community. Moreover, a training workshop was held for TWFP officers and a training module has been elaborated.

79 The British Virgin Islands reported that a tide gauge has been installed in the Virgin Islands, though it is not presently disseminating data. Contributing to the BVI's phased approach, the PRSN has installed Radio Links that are functioning at the site and have installed a new Ethernet XTERM Logger to replace a faulty unit. The next phase will be to replace the backup gauge sensor and connect the gauge via the World Wide Web for further access (PRSN is assisting in rectifying issues with its instruments). In addition, PRSN reported on the use of EMWIN system and the participation in LANTEX 2012.

80 Haiti reported on training about warning procedures and the installation of a tide gauge on the north of the country. Besides, tsunami awareness materials have been developed in Haitian Creole and tsunami hazard concerns have been included in training for journalist and local civil protection committees in different regions of the country.

81 France reported on the changes in the French Delegation, where Working Group 1 (WG1) and the Working Group 4 (WG4) are reinforced according to the needs: tide gauges and downstream alert. Instrumental projects are now all funded, and the seven planned tide gauges and thirteen seismic stations will be either upgraded or built during 2012–2013. A ComMIT training workshop was held in Pointe-à-Pitre, Guadeloupe, from 24 to 28 October 2011. LIDAR (Light Detection And Ranging) high-resolution topography and shallow depth

bathymetry are now available in Martinique and Guadeloupe. Consequently, tsunami inundation maps being developed for some pilot sites. Guadeloupe and Martinique participated to the CARIBE WAVE 11. Tsunami information panels were tested in Guadeloupe and a TV spot on tsunami was produced. Standard Operating Procedures (SOP) are in progress and a steering committee is under construction to take charge of the downstream alert.

82 Colombia informed that 10 contingency plans have been developed and five of them are being implemented. Within the framework of the European Commission Humanitarian Aid Department's Disaster Preparedness (DIPECHO) project, tsunami hazard awareness is being formally integrated into the school curricula. In addition, the law requires that tsunami issues be included in government budget at local level.

83 Barbados noted that tsunami is considered in education programmes at primary and secondary levels. Furthermore, public education materials are being distributed and lectures on tsunami are constantly organized. EMWIN and a radio base have been installed at the Disaster Management Office. A national council on tsunami has been inaugurated and the discussions of the Japan symposium have been transmitted to the general population. Finally, the support that Barbados has offered to the CTIC was mentioned.

3.8 REPORT ON THE INTERIM ADVISORY SERVICES FROM THE PACIFIC TSUNAMI WARNING CENTER

84 Mr Chip McCreery presented the Pacific Tsunami Warning Center (PTWC) report on the interim services provided to ICG/CARIBE-EWS.

85 Mr McCreery stated that the PTWC responded to more than 500 global earthquakes during the inter-sessional period and issued Observatory Messages for 372 global earthquakes. The PTWC issued Caribbean Tsunami Bulletins for just 2 earthquakes: a Tsunami Information Statement on 21 May 2011 for a magnitude 6.6 earthquake in the South Sandwich Islands, and a Tsunami Information Statement on 15 January 2012 for a magnitude 6.5 earthquake in the South Shetland Islands.

86 Mr McCreery recalled that PTWC Communication Tests are scheduled monthly (1st Thursday of month at 1530 UTC) and they began in October 2011 (5 so far). On February 2012, the test was postponed due to handling of a small Pacific tsunami. In addition, two annual unscheduled tests were held. On 4 February 2012, a tsunami message was inadvertently sent to full distribution including IOC public mailing lists and the Tsunami Bulletin Board. The other unscheduled test was held in 15 March 2012.

87 Mr McCreery indicated that new warning products are being developed for the Caribbean Region. He recalled that a Task Team for new products was identified at ICG/CARIBE EWS-VI and that the Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG) Inter-ICG Task Team 3 on Tsunami Watch Operations recommended global harmonization of tsunami products and procedures. He further recalled that current products are very conservative for safety and are based on limited historical data. Therefore, they result in significant over-warning and provide no information about the forecast levels of impact. The new products should follow the Guidelines for review of operations (IOC/TOWS-WG/TT3-I/3) developed by TOWS-WG Task Team 3 and apply forecast models. In addition, they should be constrained with seismic parameters and with tsunami wave observations. Furthermore, they should define impact regions and provide expected tsunami amplitudes.

88 The new products should have a more readable format and encompass the following components: Areas threatened recommended actions, expected arrival times, and expected

maximum wave amplitudes and preliminary earthquake parameters. These new products will be exposed at the Exercise Caribe Wave 13 for feedback.

89 When developing these products, Several Member States intervened on this item, about the timing to issue them, the training required and the technical specificities of small islands.

90 Regarding the test messages, some Member States pointed to the need for adapting SOPs to take these tests into consideration.

91 Anguilla (UK) proposed to have faxes as initial notification and ask each country if further fax notifications will be needed in case of a tsunami event.

92 Dominica requested taking into consideration volcano generated tsunamis.

93 **The ICG noted** the report of the PTWC Director and expressed its gratitude for the services provided by NOAA/NWS through the PTWC.

4. PROGRESS REPORTS BY WORKING GROUPS

4.1 WORKING GROUP 1 PROGRESS REPORT: MONITORING AND DETECTION SYSTEMS, WARNING GUIDANCE

94 This agenda item was presented by Mr Dan McNamara (United States of America), participant of Working Group 1.

95 Mr McNamara informed that as of March 2012, 77% (75/98) of the seismic stations in the Caribbean of the CARIBE EWS Implementation Plan (IOC-ICG/CARIBE EWS-III/13) are contributing data in real time. A 14% (14/98) exist but are not contributing data to the system, for 7 stations funding needs to be identified, while two are in the planning stages. There are an additional 33 stations located in the Atlantic and Pacific which are also used for tsunami warning purposes. Therefore there has been little change with regard to seismic stations contributing to the system. The most significant gaps continue to be Venezuela and Cuba. In addition, during February 2012, only 46 of the 98 stations (47%) had data archived at the Data Management Center (DMC), this lower number is because there are several networks which share their data with warning centres, but not with Incorporated Research Institutions for Seismology (IRIS).

96 Mr McNamara recalled that according to the CARIBE-EWS Implementation Plan, the goal of data availability per station is at least 90%. According to the CTWP, for February, at PRSN 54% of the 75 stations had a data availability of 90-100%, at WCATWC 55% of the 75 stations had a data availability of 90-100% and for IRIS 57% of the stations had data availability in the range of 90-100%. Important to note is the decrease in data availability for Hispaniola (Haiti and Dominican Republic). Since January 2012, there has been no data from any of the three seismic stations in Haiti and the two stations operated by the PRSN with the Seismological Institute of Dominican Republic (ISU) and the station (PUCMM) operated by University Texas at Austin/Baylor University has been non-operational since early 2011 or late 2012.

97 Regarding sea-level observation, Mr McNamara informed that currently there are 45 sea-level stations (including 7 DART and 38 coastal gauges) that are operational and integrated into the warning system. This represents 42% (45/107) of the stations in the CARIBE-EWS operational plan. During the inter-sessional 2011−2012 period, new sea-level stations were installed in Grenada and Dominica (US-UHSLC-PRSN), Cap Haitien (UNESCO-Haiti-PRSN) and Martinique and Barbuda (US-Antigua & Barbuda). The National

Environmental Satellite, Data, and Information Service (NESDIS) of the National Oceanic and Atmospheric Administration (NOAA), despite limited resources, has been able to accommodate all requests for Geostationary Operational Environmental Satellite (GOES) slots for stations of the CARIBE-EWS. These efforts are also being coordinated with the Global Sea-Level Observing System (GLOSS) of the Intergovernmental Oceanographic Commission (IOC) of UNESCO.

98 In addition, with United States funding, the University of Hawaii Sea-Level Centre (UHSLC) and the Puerto Rico Seismic Network (PRSN) are planning to install three tide gauges in Colombia (2) and Panama. PRSN and ONAMET will be installing a tide gauge in Barahona, south west coast of Dominican Republic. A station has been purchased to be installed in Barbados (UNESCO-Barbados-CTWP). Two new sea-level stations are to be installed/upgraded by the French Naval Hydrographic and Oceanographic Service (SHOM) in Île Royale, French Guiana, and Pointe-à-Pitre, Guadeloupe. Martinique also has plans to install an additional sea-level station.

99 Additional funding from Brazil and St. Vincent and the Grenadines has been provided through UNESCO to CARIBE-EWS to also strengthen sea-level observations in the Caribbean. Finally, Mr McNamara recalled that the Third Caribbean Training Course for Operators of Sea Level Stations will be held in Merida, Mexico, from 4 to 9 June 2012.

100 The Chair asked if there is cooperation for the maintenance of the seismic stations at the national level. The Vice-chair noted that there is no lack of support for maintenance of stations since they are an important part of the system. It was noted that after the 12 January 2010 earthquake in Haiti, seismic stations were installed but maintenance has been problematic. It was recommended to determine how to encourage agencies to support maintenance of stations in Haiti. British Virgin Islands recommended that local experts be from the beginning of the installation of seismic stations to enhance local capacity for maintenance.

101 Barbados noted the importance of updating the list of stations contributing to the systems.

102 Bermuda inquired about the possibility of monitoring non-earthquake tsunami sources such as volcanoes. Mr McNamara proposed to include a recommendation to update the implementation plan to include volcano sources.

103 **The ICG approved** Recommendation ICG/CARIBE-EWS-VII.1.

4.2 WORKING GROUP 2 PROGRESS REPORT: HAZARD ASSESSMENT

104 This agenda item was introduced by Mr Aurelio Mercado (United States of America), Chair of Working Group 2. Mr Mercado reported on the activities conducted in the French Caribbean, Dominican Republic, Puerto Rico and British Virgin Islands.

105 He stated that the Université des Antilles et de la Guyane (UAG) located in Pointe-à-Pitre, Guadeloupe, hosted the Community model interface for tsunami (ComMIT) training workshop from 24 to 28 October 2011. The course was sponsored by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the project Caribbean INTERREG in order to enhance tsunami modelling capabilities in the region. The training was provided by two experts from the NOAA Center for Tsunami Research. Representatives of 11 Member States and Territories in the Caribbean attended the workshop. It was emphasized the need for better bathymetry and topography.

106 Mr Mercado reported on the creation of tsunami flood maps for parts of the Dominican Republic based on declaring a strip of coastal land 2 km wide, or up to 20 meters in elevation, as potentially floodable. He further reported that, as part of the USA National Tsunami Hazard Mitigation Program (NTHMP), a new generation of tsunami flood maps has been prepared replacing the ones produced in 2003 in Puerto Rico. These were made using NOAA´s MOST (Method of Splitting Tsunami) model, with high-resolution and up-to-date bathymetry and topography. Results are presented in different formats, including Google Earth kmz files and ESRI shapefiles. A total of 277 simulations were run, all based on potentially local sources and six historical earthquake events. It remains to identify the regional and far-field sources and make the corresponding maps.

107 In addition, computer simulations due to submarine landslides were started last summer using the combination of the TSUNAMI-3D and NEOWAVE models of Mr Juan Horrillo (Texas A&M University at Galveston, Texas). This work will continue this coming summer. The unstructured grid (Finite Elements mesh) tsunami version of the SELFE model, used at the state of Oregon, USA, has been implemented at Puerto Rico as part of a Master of Science thesis. This type of mesh allows for a faithful reproduction of the very irregular coastline of the island, having very high resolution where needed and expanding to lower resolutions otherwise. This was also sponsored by NTHMP.

108 Tsunami flood mapping has started for the British Virgin Islands as part of UNDP's Regional Risk Reduction Initiative (R3i), sponsored by the European Commission. This work is being done by the Jamaican company SWIL, together with the Dutch company Deltares. The model being used is DELFT-3D. Bathymetry and topography are also being acquired by locally hired surveying companies.

109 Finally, Mr Mercado informed that the paper *Tsunami hazard in the Caribbean: Regional exposure derived from credible worst case scenarios* by Mr C.B. Harbitz, first had been submitted to Continental Shelf Research. The author had given approval for dissemination at the ICG. The accepted manuscript (unedited version) is available online.

110 At this point, Saint Lucia encouraged Member States to develop a mechanism to address ICG concerns about the low involvement of some members of the Working Groups. She mentioned the example of Working Group 2 that has 14 members but only 3 members participate actively.

111 **The ICG discussed** whether additional functions should be considered in the Terms of Reference of WG2 such as vulnerability analysis. Mr Mercado expressed concern about doing modelling without reliable bathymetry and topography, which is a basic element for hazard and, by extension, vulnerability assessment.

112 **ICG decided** to update all Working Groups membership lists together with contact information. The members' lists of all Working Groups were reviewed and updated in plenary.

4.3 WORKING GROUP 3 PROGRESS REPORT: WARNING DISSEMINATION AND COMMUNICATION

113 This agenda item was presented by Ms Elizabeth Klute (UK), Chairperson (a.i.) of Working Group 3.

114 Ms Klute reported on a second training workshop on the use of the Emergency Managers' Weather Information Network (EMWIN) for the Regional Risk Reduction Initiative (R3i) of the United Nations Development Programme (UNDP) that covers Member States in the British and Dutch Overseas Countries and Territories (OCT), hosted by the UNDP

Barbados and the Organization of Eastern Caribbean States (OECS) held in Aruba from 4 to 6 May 2012. The Caribbean Institute of Meteorology and Hydrology (CIMH) will also begin holding regional EMWIN training to ensure the sustainability of the programme. This is to be further considered in the coming year.

115 Fourteen participants attended the training with support provided by the National Weather Service (NWS), the UNDP Barbados, and the University Corporation for Atmospheric Research (UCAR) Joint Office of Science Support (JOSS) by the International Extension and Public Alert System (IEPAS) programme. Countries represented were: Anguilla, Aruba, Barbados, Cayman Islands, Curacao, Montserrat, Turks and Caicos Islands and Virgin Islands (UK). Six EMWIN Stations were provided to countries that did not otherwise have one, as was CIMH towards supporting regional training.

116 Regarding exercise and TWFP/TNC updates, Ms Klute reported on the 24/7 Focal Points of Member States, and their alternates who were reminded by a letter from the Pacific Tsunami Warning Center (PTWC) to actively participate in the communication tests of the Tsunami Warning Centre by responding to questions asked in the test messages and by acknowledging receipt of official messages from the centre by sending a response back. Member States were requested by Working Group 3 (WG3) to keep the ICG updated on the Tsunami National Contacts and Tsunami Warning Focal Points contact information.

117 As instructed by the ICG, WG3 via the PTWC conducted tsunami warning tests the first Thursday of every month at 1530 (UTC/GMT) beginning in October 2011. During the first few scheduled tests, some countries identified problems which were subsequently mitigated. More recently, there have been no responses following the tests; therefore it is assumed that there are no current issues with the communications.

118 Ms Klute reported that the World Meteorological Organisation (WMO) has set up a Global “Register of WMO Members Warning Authorities" with the purpose of recording the official sources of warning for each country. Ms Klute outlined the basic concepts of the programme and shared a request from the WMO for the ICG/CARIBE via the WG3, to request its members to update their authority designation. The Chair (a.i.) identified that there could be some issues with the phrasing of the Priorities of WMOs Programme which led to the development of the data repository and a mechanism for inclusion of countries represented through contractual arrangements (e.g. the Overseas Territories) at the WMO.

119 The Vice-chair raised a concern that the “Register of WMO Members Warning Authorities" did not specifically note tsunamis under the heading of GEO Hazards on their website. The Chair (a.i.) agreed to raise this issue with the WMO to have this issue remedied immediately.

120 Regarding the WMO Information System Implementation, Ms Klute reported that the WMO/ITU (International Telecommunication Union) Information System (WIS) is now operational in three Global Information System Centre (GISC) Locations as of 31 January 2012. These are China, Germany and Japan. The GISC in Washington, D.C. is not yet operational. China and Japan's interim metadata management service is providing this functionality of WIS to those centres whose principal GISC is not operational (Washington, D.C.), this includes all the Caribbean countries.

121 Ms Klute reported that Caribbean countries, if they wish to start reviewing and working on their metadata will need to register with GISC Tokyo or GISC Beijing who are backstopping until the Global Information System Centre of Washington, D.C. is operational. This can be done through the GISC page at the WMO website (http://www.wmo.int/pages/prog/www/WIS/GISCs.html) and going to the instructions on their Interim Metadata Management Service at either of Tokyo or Beijing.

122 Lastly, there have been questions regarding the cost of implementing the upgraded WIS and WG3 was asked to search for information. The response received from Mr David Thomas, Chief of Information and Telecommunication Division of the Observing and Information Systems Department of the World Meteorological Organization, states: "If centres choose to use the GISC Metadata Management Service then there is no cost of implementing WIS from a system or hardware perspective as the GISC is providing the entire infrastructure. However, if they choose to build their own metadata management system, then the cost increases just like introducing any application to an operational system has costs".

123 Several Member States, Chair and Vice-chair intervened under this item, with respect to Global Telecommunication System (GTS) issues and their possible impact on EMWIN use. A follow-up meeting was held with the representatives of Barbados, Bermuda, and Curacao regarding the issue of costs, access to GTS capability, and possible impacts to receipt of tsunami messages.

124 The Chair (a.i.) of WG3 reported that at the conclusion of the discussions, clarification was received from Curacao and Bermuda that the core functionality required for receipt of Tsunami Watches or Warnings via GTS was made available at no charge from the WMO to all member countries via web download. It was further identified that the upgrade issues and associated costs were related to weather forecast and analysis software of the WIS, not the GTS, and that these costs were associated to individual vendors and their technology upgrades to these latter components.

125 **ICG noted** the report of Working Group 3.

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

126 This agenda item was introduced by Mr Juan Salado (Dominican Republic), Vice-Chair of Working Group 4 and Ms Julie Leonard, member of Working Group 4.

127 Ms Leonard reported on the Meeting of the Working Group IV of the ICG/CARIBE EWS held at United Nations House, Hastings, Barbados, on 6 and 7 February 2012, as part of the establishment process for the Caribbean Tsunami Information Centre (CTIC). Eleven representatives from the Dominican Republic, United States of America, Barbados and IOC/UNESCO as well as from the observer organisations of the Caribbean Disaster Emergency Management Agency (CDEMA), University of the West Indies, Seismic Research Centre (SRC), Caribbean Institute for Meteorology and Hydrology (CIMH) and UNDP participated in the Working Group IV Meeting.

128 The meeting dealt mainly with the CTIC implementation. Main recommendations included:

(i) Priority should be given to finalisation of the staffing arrangements for the CTIC's core staff through secondments and other mechanisms to ensure a smooth and efficient transition from establishment to operation by June 2012;

(ii) ICG/CARIBE-EWS Member States should pledge contributions to the CTIC at ICG/CARIBE EWS-VII;

(iii) the adoption of the "Tsunami Smart" brand for the Caribbean tsunami warning and mitigation programme and the need for robust and redundant emergency telecommunications particularly for the TWFPs were key recommendations for consideration at ICG/CARIBE EWS-VII; and

(iv) priority should be given to building the multi-lingual capacity of the CTIC and the implementation of the CTIC Business Plan.

129 **The ICG approved Recommendation ICG/CARIBE EWS-VII.3**.

5. SPECIAL INVITED LECTURES: COMMUNITY-BASED TSUNAMI WARNING SYSTEM

130 Under this agenda item, the Chairperson referred to the Recommendation ICG/CARIBE EWS-IV.4, which urges Member States to consider the recommendations of the "Good Practices on Tsunami and Coastal Hazards Community Preparedness and Readiness in Central America and the Caribbean" workshop (Panama City, Panama, 11–13 August 2008). In this respect, representatives of Dominican Republic and Anguilla (UK) were invited to present their activities with focus on the development of their community-based warning systems.

131 Mr Juan Salado explained the functioning of the programme "Acción Tsunami" of ONAMET which mainly promotes a participatory approach to implement tsunami risk reduction at community level. Through the establishment of voluntary working groups, local communities can coordinate with central level initiatives such as tsunami mapping, sign posting, teacher training and others. Bayahibe, Dominican Republic, was shown as an example of the impact of the programme.

132 Anguilla was the first international community to be granted the distinction of being recognized as TsunamiReady, introduced Mr Damian Barker. The requirements to meet this specification included having multiple means of receiving tsunami information, a 24 hours facility to process this information, and multiple means of disseminating the information to the public.

133 Mr Baker outlined that Anguilla was well prepared to garner this valuable recognition, primarily because of the pre-existence of the Anguilla Warning System. The Anguilla Warning System is Anguilla's Common Alert Protocol (CAP) based warning system which allows the department of Disaster Management along with other pre-approved agencies (such as Police and Fire) to send waning messages via multiple means directly to the Anguillian public quickly and easily. Dissemination methods include email, radio broadcast interruption, and computer "pop up" notification.

134 Mr Baker explained that in the case of a tsunami, Anguilla has a recently developed draft Tsunami protocol which allows for the activation of the Anguilla Warning System either directly by the Tsunami Warning Focal Point (The Royal Anguilla Police Force designated primarily because of its 24 hours operation) or by the Department of Disaster Management depending on the time of impact of the wave.

135 He also explained that further requirements of the TsunamiReady certification included public awareness campaigns, the erection of signs, and the creation of a tsunami hazard map identifying unsafe areas, safe zones and routes and Assembly points. Mr Baker highlighted that the latter of these requirements were achieved with much success with the tireless assistance of Ms Christa Von Hildenbrant who was essential in propelling the project to its successful conclusion. Public Education and outreach activities are ongoing as well as upgrades to the Anguilla Warning System which will allow us to reach an even greater percentage of the public than we are presently capable of.

136 Finally, he pointed out that the TsunamiReady is an ongoing certification which means that in two years Anguilla will have to be re-certified and therefore tsunami awareness and education is a permanent part of our outreach campaign.

6. POLICY MATTERS

6.1 ESTABLISHMENT OF A CARIBBEAN TSUNAMI WARNING CENTRE

137 The Chairperson introduced this topic recalling that according to Recommendation ICG/CARIBE EWS-II.3, the Group decided to establish a Caribbean Tsunami Warning Centre (CTWC) to be located in the region. Also, through Recommendation ICG/CARIBE EWS-II.12, it agreed to actively plan to take over the full responsibility for the system with a Caribbean Tsunami Warning Centre in the region by 2010. She recalled that at the Fifth Session of ICG/CARIBE EWS held in Managua, Nicaragua, from 15 to 17 March 2010, the ICG welcomed and appreciated Venezuela's efforts and technical advances for the establishment of a Caribbean Tsunami Warning Centre, welcomed and appreciated Nicaragua's efforts and technical advances for the establishment of a Caribbean Tsunami Warning Centre and welcomed and appreciated the United States efforts for establishing a Caribbean Tsunami Warning Program at the University of Puerto Rico, Mayaguez, in Puerto Rico, United States of America, as part of a phased contribution to the establishment of a Caribbean Tsunami Warning Centre. Furthermore, through Recommendation ICG/CARIBE EWS-VI.2, urged the United States of America to continue the phased implementation of the Caribbean Tsunami Warning Centre co-located with the Puerto Rico Seismic Network at the University of Puerto Rico at Mayaguez to serve the Caribbean and Western Atlantic basin by December 2012.

138 The Chairperson offered the floor to Member States to report on progress made in the establishment of a CTWC.

139 United States highlighted the importance of the Tsunami Programme (TSU) of IOC of UNESCO composed by four Intergovernmental Coordination Groups and the strategic advisory of specialized Working Groups supporting critical harmonization as essential to the protection of life. He urged clearer membership inclusion for the two IOC/UNESCO Atlantic Basin Tsunami Warning System to actively include all of the western and eastern Atlantic basin coastal areas (e.g. all Caribbean/western Atlantic nations southward through Argentina/Cape Horn, and all Eastern Atlantic basin coastal areas from Greenland southward to South Africa/Cape of Good Hope for the ICG/NEAMTWS)

140 He acknowledged the establishment of the NOAA National Weather Service Caribbean Tsunami Warning Program in February 2010, and its vital support to the Caribbean and to the effectiveness of the entire NWS Tsunami Warning System including PTWC and West Coast and Alaska Tsunami Warning Center (WCATWC).

141 While the United States of America continues to support phased implementation for the establishment of the Caribbean Tsunami Warning Centre at the University of Puerto Rico at Mayaguez (UPRM) to serve the Caribbean and Western Atlantic Basins, it recognizes that implementation has been slowed due to resource constraints. Nevertheless, progress continues within existing NWS resources and important milestones have been achieved in the past two years such as the: signing of a lease to collocate the National Weather Service Caribbean Tsunami Warning Program with the Puerto Rico Seismic Network at the UPRM; launching of annual (e.g. LANTEX) regional-wide preparedness/communications exercises and monthly PTWC communications tests. In addition, development of new timely tsunami warning and informational products as presented by the NWS Pacific Tsunami Warning Center (PTWC) has been well received by Member States as vital support to the entire ICG/CARIBE EWS of UNESCO and adjoining areas. It was also reiterated, the US actively welcomes suggestions, concerns and support regarding the new services, as well as components of its phased implementation of the CTWC.

142 The US Virgin Islands representative, General Elton Lewis, Director of Emergency Management, noted strong support for a Caribbean Tsunami Warning Centre at UPRM from both the U.S. Virgin Islands and the Commonwealth of Puerto Rico Governors for the establishment of a Caribbean Tsunami Warning Centre UPRM serving their Territories from UPRM at Puerto Rico.

143 The Chair recalled that during the Sixth session of the ICG/CARIBE EWS, the Bolivarian Republic of Venezuela was invited to present a document defining the roles of the additional regional tsunami warning centres at the Seventh session of the ICG/CARIBE EWS.

144 The Bolivarian Republic of Venezuela apologized for not being able to present the document and recalled the efforts concerning seismic monitoring that have been undertaken in the country. Curacao expressed compliments for FUNVISIS (Fundación Venezolana de Investigaciones Sismológicas) and noted its collaboration with Venezuela.

145 Bermuda inquired if there is a new revised timetable for the implementation of the CTWC given the current funding restrictions. United States of America clarified that as the congress is the deliberating body that allocates funding, the timetable could be revised once there is notification of availability of the funds.

146 US Virgin Islands proposed that Member States address a support letter to sensitize the US Congress on the importance of the CTWC.

6.2 SECOND CARIBBEAN TSUNAMI EXERCISE (CARIBE WAVE 2013)

147 The Chairperson introduced this topic recalling that during the Fifth session of the ICG/CARIBE EWS (Managua, Nicaragua, 15–17 March 2010), it was agreed to hold a Caribbean Wide Tsunami Exercise every two years. She invited a representative of the intrassessional Working Group on CARIBE WAVE 13 to present the recommendations.

148 Mr Jean Marie Saurel, France, informed that an intrassessional Working Group agreed that the new Exercise CARIBE WAVE 13 will take place at the same time as LANTEX 13, 20 March 2013. The scenario will be based on an M 8.5 earthquake off the north western coast of Venezuela. The Working Group (WG) also agreed to use the official communication links between PTWC and TWFP only for the first message announcing the beginning of the Exercise. The following messages should be sent in a timely manner to a mailing list. The participants expressed that messages need not include anything more than would be included in a real message, to help keeping the exercise as realistic as possible. The WG recommended testing the new products prepared by PTWC, but on a separate mailing list, in order not to confuse users.

149 The Exercise CARIBE WAVE 11 (IOC/2010/TS/93 Rev.) was very successful, but some participants expressed the need to have more quantitative evaluation of the results. Therefore, they proposed to have measurable objectives for the whole Caribbean basin, as well as for each participant.

150 The intrassessional WG also proposed that each participating country should register on the Exercise website and publish their objectives, in order to have a better estimation of the results of the Exercise. The participants discussed and agreed the proposed timeline, and the fact that the Exercise Manual should be available in English, Spanish and French. They also agreed that the draft manual should be sent to TWFPs and TNCs. Participants finally agreed on the creation of a Task Team to prepare the Exercise and Manual, and proposed some updates in its member list, such as the addition of the CTIC manager.

151 The Chair of Working Group 2 and Venezuela considered the scenario to be not credible. However, Venezuela indicated that for the objectives of an Exercise it was a convenient option. The Technical Secretary of the ICG/CARIBE-EWS recalled that Members States should expect the unexpected and be prepared for maximizing scenarios.

152 It was informed that under this fictional scenario, tsunamis are expected in Curacao, and higher waves in Santo Domingo. Aruba pointed out that given the magnitude of the earthquake, they would be affected also by a major earthquake. In this sense, Member States were encouraged to include the earthquake effects in the scenario and it was proposed that United States Geological Survey (USGS) provides support for the elaboration of shake maps.

153 Bermuda inquired if they would receive notification as they are not part of the Caribbean. It was clarified that new products would include Puerto Rico, Virgin Islands and Bermuda.

154 **The ICG decided** to continue the Task Team on enhanced tsunami warning products for the ICG/CARIBE-EWS that is composed of the ICG Officers, PTWC Director and CTWP Manager. The Task Team should continue providing guidance on development and validation of the new PTWC products, as well as testing the new products during the CARIBE WAVE 13 Exercise. The Task Team will provide a report to the Eighth session of the ICG/CARIBE-EWS. It will continue to be chaired by the Director of the Pacific Tsunami Warning Center (PTWC).

155 **The ICG approved Recommendation ICG/CARIBE EWS-VII.4**.

7. UPDATES TO THE CARIBE-EWS IMPLEMENTATION PLAN

156 The Chair stressed that the ICG/CARIBE-EWS has entered in a new phase and this should be reflected in the Implementation Plan (IOC-ICG/CARIBE EWS-III/13). Key structures such as the CTIC, functioning of the CTWC, main requirements for the CTWC and the contribution from Venezuela, including the conditions of a back-up Caribbean Warning Centre should be considered in the Implementation Plan.

157 **The ICG agreed** to establish a Task Team to completely revise the Implementation Plan, composed of Ms Judy Thomas (Barbados), Mr Jean Marie Saurel (France), Mr Julian DuBois (Saint Lucia) and Mr Daniel McNamara (USA).

8. PROGRAMME AND BUDGET FOR 2013−2014

158 This item was only informational and was introduced by the Technical Secretary who provided current information on the financial limitations that UNESCO is facing and the actions taken by the management towards stabilising the situation.

159 He highlighted that the Tsunami Programme and the ICG/CARIBE-EWS continue to attract positive remarks by Member States at UNESCO and IOC Governing Bodies. He indicated that contributions from Member States through the UNESCO Emergency Fund or through the IOC Special Account, if specifically addressed to the ICG/CARIBE-EWS, are welcomed.

9. NEXT SESSIONS

9.1 CONFIRMATION OF DATE AND PLACE OF THE EIGHT SESSION OF THE ICG/CARIBE-EWS

160 The Chair introduced this item by recalling that, at the Sixth session of the ICG/CARIBE EWS Trinidad and Tobago, offered to host the Eighth session.

161 Trinidad and Tobago confirmed its willingness to host the Eighth Session. Trinidad and Tobago was informed that a formal confirmation needed to be delivered by the Government. Sint Maarteen and US Virgin Islands offered to be considered as a backup option.

162 The tentative date of the meeting should be the week of 29 March 2013, considering the CARIBE WAVE 13 and the WMO Hurricane Committee meeting.

163 **The ICG acknowledged** these offers with appreciation and **agreed to** hold the Eighth session of the ICG/CARIBE EWS in Trinidad and Tobago, considering Sint Martin and US Virgin Islands as alternate options, during the week of 29 March 2013.

9.2 TARGET DATE FOR THE NINTH SESSION OF THE ICG/CARIBE EWS

164 **The ICG agreed** March 2014 as a target date for the Ninth Session of the ICG/CARIBE EWS. Sint Martin (Netherlands) offered to host ICG/CARIBE EWS-IX.

10. OFFICERS ELECTIONS

165 The Chair of the Intrasessional Elections Commission, Mr Albert Martis from Curacao, introduced this agenda item. He informed Delegates that elections should follow the established IOC Rules of Procedure and briefly reviewed procedure to be followed.

166 The ICG was requested to elect one Chairperson and three Vice-chairpersons to act as Officers of the IOC Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions for the two-year intersessional period (2012−2014).

167 Mr Martis reported that one nomination for the Chair was received and three nominations were received for the existing three Vice-chair positions by the Secretariat. Ms Christa von Hillebrandt-Andrade (United States) was elected by acclamation as Chairperson for the period 2012−2014. Mr Philippe Sarron (France), Ms Dawn French (Saint Lucia) and Mr Victor Hugo Cano Pacheco (Venezuela) were elected as Vice-chairs of the ICG/CARIBE-EWS for 2012−2014.

168 Working Group officers were also elected. For Working Group 1: Mr Emilio Talavera (Nicaragua) was re-elected Chair, Mr Sebastien Deroussi (France) Vice-chair for sea level, and Mr Miguel Palma (Venezuela) for seismology. Regarding Working Group 2: Mr Narcisse Zahibo (France) was elected Chair. For Working Group 3: Ms Elizabeth Klute was elected Chair and Mr Chip McCreery (USA) Vice-chair. Finally, for Working Group 4, Mr Kerry Hinds (Barbados) was elected Chair and Mr Juan Salado (Dominican Republic) as Vice-chair. Two new members were incorporated in Working Groups: Working Group 2, Mr Frederic Dondin (Seismic Research Center); and Working Group 4, Mr Antonio Aguilar (Venezuela).

11. ANY OTHER BUSINESS

169 In this agenda item the usefulness of webinars was noted, particularly when cost limitations preclude working group members to meet.

170 **The ICG decided** to improve the process of how the Working Groups work by hosting more regular meetings using virtual-internet based methods.

171 **The ICG decided** to suggest to the IOC Executive Council that its Area of Responsibility (AOR) be revisited to include all coasts of the western Atlantic not currently covered as part of an ICG or otherwise covered by a tsunami warning centre. This includes coasts of Greenland, Brazil, Uruguay and Argentina.

12. ADOPTION OF DECISIONS AND RECOMMENDATIONS

172 Based on the reports of the Working Groups and discussions at the Plenary Sessions, **the ICG adopted** four Recommendations.

13. CLOSURE OF THE SESSION

173 The Chair of the ICG/CARIBE EWS thanked the Government of Curacao for hosting the session and thanked the Local Organizing Committee for the excellent facilities provided for the organization of the meeting.

174 The Dominican Republic, Barbados, Curacao and Haiti expressed their satisfaction with the results of the meeting, thanked the Government of Curacao for hosting the meeting and highlighted the importance of continued strengthening of the bonds of cooperation among all Member States.

175 The Seventh Session of the IOC Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions was closed at 17:24 hours on Wednesday, 4 April 2012.

ANNEX I

AGENDA

1. WELCOME AND OPENING

1.1. REPRESENTATIVE OF THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION OF UNESCO

1.2. DR LORNA INNISS: DEPUTY DIRECTOR, COASTAL ZONE MANAGEMENT UNIT CZMU - BARBADOS, ICG/CARIBE EWS CHAIR

1.3. WELCOME ADDRESS BY NATIONAL AUTHORITIES

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. CHAIR'S REPORT

3.3. CARIBE EWS SECRETARIAT REPORT

3.4. REPORT OF THE CARIBEAN TSUNAMI INFORMATION CENTER (CTIC)

3.5. REPORTS FROM UN AND NON UN ORGANISATIONS

3.6. STATUS OF OTHER ICGS

3.7. NATIONAL PROGRESS REPORTS

3.8. INTERIM ADVISORY SERVICES REPORT (PTWC)

4. WORKING GROUP PROGRESS REPORTS

4.1. WORKING GROUP 1 PROGRESS REPORT: MONITORING AND DETECTION SYSTEMS, WARNING GUIDANCE

4.2. WORKING GROUP 2 PROGRESS REPORT: HAZARD ASSESSMENT

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

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

5. SPECIAL INVITED LECTURES: COMMUNITY-BASED TSUNAMI WARNING SYSTEM

5.1. ACCION TSUNAMI, DOMINICAN REPUBLIC

5.2. FIRST NON US TSUNAMI READY COMMUNITY

6. POLICY MATTERS

6.1. ESTABLISHMENT OF A CARIBBEAN TSUNAMI WARNING CENTER

6.2. SECOND CARIBEAN TSUNAMI EXERCISE (CARIBE WAVE 13)

7. UPDATES TO THE CARIBE EWS IMPLEMENTATION PLAN

8. PROGRAMME AND BUDGET FOR 2013–2014

9. NEXT MEETING

9.1. CONFIRMATION OF DATE AND PLACE OF ICG/CARIBE EWS-VIII

9.2. TARGET DATE FOR ICG/CARIBE EWS-IX

10. OFFICERS ELECTION

11. ANY OTHER BUSINESS

12. ADOPTION OF DECISIONS AND RECOMMENDATIONS

13. CLOSE OF THE MEETING

ANNEX II

ADOPTED RECOMMENDATIONS

Recommendation ICG/CARIBE EWS-VII.1

Monitoring and Detection Systems, Warning Guidance

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

Noting the report of Working Group 1 Monitoring and Detection Systems, Warning Guidance,

Recalling the Recommendation ICG/CARIBE EWS-IV.1 on Monitoring and Detection Systems, Warning Guidance which urged Member States and other stakeholders to provide funding for observational networks and communication systems,

Having reviewed the status and capabilities of the seismic, sea-level and DART stations in the region contributing data to the CARIBE-EWS,

Recognizes again the importance of the local and regional seismic networks sharing high-quality data with other countries and to the Tsunami Warning Centre and IRIS DMC to enhance the national regional warning and research capabilities for the Caribbean;

Acknowledges the COCONet Project funded by the US and its plan to install 50 new continuous Global Navigation Satellite System (cGNSS) and meteorology stations in the Caribbean and Central America, refurbish an additional 15 stations, and archive data from 62 cGNSS stations for free and open data access;

Urges Member States to support the COCOnet project in their corresponding jurisdictions and their integration in support of regional research and monitoring;

Recognizes the challenges of very large tsunamis/earthquakes and the need for integrating the lessons learned from Tohoku Japan Tsunami into the CARIBE-EWS with special attention to the determination and reporting of very large magnitude events, redundancy of website communication systems for focal points of earthquake and tsunami information (Tsunami and Earthquake Centres);

Further recognises the need for some off-shore tsunami measurements (DART) and the rapid dissemination to the public of the warnings and need for forecast impacts for all areas at risk, including tsunami event duration;

Urges the expansion of the DART network near tsunamigenic sources;

Requests that the CARIBE-EWS Communications Plan be updated to reflect the current status of the sea-level and seismic stations, as well as the forecast points;

Urges the planning and execution of technical training for seismic and sea-level network operators, as well as the emergency management community on the proper installation, maintenance and usage of instruments;

Suggests exploring alternatives for on-line training in addition to the traditional onsite training;

Urges Member States to:

(i) support Haiti and Dominican Republic in the transition of temporary/portable seismic stations to permanent status and installation of new stations for improvement of long-term earthquakes and tsunami monitoring,

(ii) complete the CORE sea-level and DART station network;

Recommends the revision of the implementation plan to reflect achievable sea-level station requirements;

Encouraged Member States to enhance the seismic and sea-level network in order to continue the construction and operation of a robust earthquake and tsunami monitoring network;

Continues to encourage Member States to support and maintain seismic and sea-level stations with routine data and meta-data verification in order to increase station performance and data availability for tsunami monitoring;

Urges Member States to support research and development of monitoring tsunamigenic events from non-earthquake sources such as submarine landslides and volcanic activity;

Encourages Member States to improve participation and involvement from the sea-level community in Working Group I by hosting more regular meetings using virtual-internet based methods.

Financial implications: None

Recommendation ICG/CARIBE EWS-VII.2

Caribbean Tsunami Information Centre (CTIC)

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

Recalling:

(i) Recommendation ICG/CARIBE EWS-IV.6 on the establishment of a Caribbean Tsunami Information Centre, and the acceptance by the ICG/CARIBE-EWS of the offer by Barbados to host the Centre,

(ii) Recommendation ICG/CARIBE EWS-VI.1 that instructed the Working Group IV to begin developing CTIC first business plan and to present the 2012 work plan at the Seventh Session of the ICG,

Recognizing:

(i) the work carried out by the Government of Barbados and the Interim CTIC staff in responding to requests from Member States,

(ii) the work of the CTIC Consultant in developing the draft business plan for the permanent CTIC and the Draft TOR for the CTIC Board,

Acknowledging the support of Working Group IV and the Interim CTIC Board in providing guidance and feedback on the draft documents,

Instructs the CTIC to formalise a memorandum of understanding (MOU) with the General Council of Martinique outlining their contributions to CTIC and its corresponding work plan;

Strongly urges Member States to make pledges and provide direct and in-kind contributions to the execution of the CTIC Work Plan activities through the following:

- Memoranda of understanding
- Voluntary contributions to the IOC Special Account
- Support for specific activities;

Noting that such contributions will be accounted for in reporting and invoicing as required,

Requests the CTIC and Working Group IV to seek additional resources to fulfil the needs of all Member States for initiatives identified by the ICG;

Approves the Draft CTIC Business Plan with amendments, noting that the 2012 operational budget of US$ 312,500 is being provided by the ERC Project;

Also approves the Terms of Reference for the CTIC Board, with amendments as in Annex III of the session report (IOC/ICG/CARIBE EWS-VII/3).

Financial implications: USD 20,000 from the UNESCO Emergency Fund

Recommendation ICG/CARIBE EWS-VII.3

Preparedness, Readiness and Resilience

The Intergovernmental Coordinating Group for Tsunamis and Coastal Hazards Warning System for the Caribbean and Adjacent Regions,

Recalling Recommendation ICG/CARIBE EWS-IV.4 on Preparedness, Readiness and Resilience,

Acknowledging the efforts of Working Group IV, Preparedness Readiness and Resilience,

Recognising the on-going establishment process for the CTIC and the planned activities to be executed by the CTIC during 2012,

Requests:

(i) Working Groups III and IV and the CTIC to develop a training strategy and schedule by ICG/CARIBE EWS-VIII,

(ii) Working Group IV and the CTIC to convene a meeting as soon as possible to develop the training strategy and schedule with input from Working Group III;

Instructs:

(i) Working Group IV and the CTIC to develop a strategy for promoting and implementing a community-based recognition programme for tsunami preparedness by the ICG/CARIBE-EWS at its Eighth Session,

(ii) the Secretariat, in consultation with the ICG/CARIBE-EWS Officers, to draft new Terms of Reference for WG IV, having due regard to the responsibilities of the CTIC Board, and submit to Member States for comment during the intersessional period with a view to ratification at the Eighth Session of the ICG.

Financial Implications: None

Recommendation ICG/CARIBE EWS-VII.4

CARIBE WAVE 13 Exercise

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

Recalling the successful planning and execution of the CARIBE WAVE 2011 and LANTEX 2009, 2010, 2011 and 2012 US Western Atlantic exercises,

Acknowledging the frequency of seismic and tsunami events at the global and regional levels, and the devastating impacts following the Haiti, Chile and Japan earthquakes and tsunamis,

Recognizing the tremendous vulnerability to life and livelihoods from tsunamis in the region,

Acknowledging further the opportunities for partnerships with other bodies that coordinate and execute region-wide exercises,

Understanding the importance of testing and refinement of warning systems and national protocols,

Recommends conducting a joint CARIBE-WAVE 2013 and LANTEX 2013 exercise in the Western Atlantic, Caribbean and Adjacent Regions on 20 March 2013;

Endorses the establishment of a Task Team which includes the ICG Officers, Technical Secretary of ICG/CARIBE EWS, Manager of Caribbean Tsunami Warning Programme (CTWP), Director of CTIC, Director of ITIC, Directors of PTWC and WCATWC and representatives of CEPREDENAC and CDEMA to oversee the exercise. This Task Team will be chaired by the Manager of the CTWP;

Urges Member States to establish their own national task teams to determine the scope of their national participation, testing, and objectives;

Agrees to the scenario, objectives and reviewed timelines for the exercise as prescribed in the ANNEX IV of the session report (IOC/ICG/CARIBE EWS-VII/3), including the preparation of the CARIBE WAVE 13 Manual in Spanish, English and French;

Recommends:

(i) That the new products proposed by the PTWC be tested during the exercise in addition to the existing products, in a timely manner, using different mailing lists, and that the products limit themselves to information that would be included in a real event,

(ii) To collaborate with regional seismic institutions, the Global Earthquake Model (GEM) and USGS on the scenario, so as to provide shake maps and intensity estimates for the Caribbean region,

(iii) The adoption of quantitative objectives and per participants objectives in order to have more precise evaluation,

(iv) That the Eighth Session of the ICG/CARIBE EWS be held on a date following the exercise and conclusion of the preliminary report.

Financial Implications: None

ANNEX III

TERMS OF REFERENCE: CARIBBEAN TSUNAMI WARNING CENTRE (CTWC) AND CARIBBEAN TSUNAMI INFORMATION CENTRE (CTIC) BOARD

1.0 BACKGROUND

Large zones of the Caribbean and Adjacent Regions are vulnerable to earthquake induced tsunamis. During the last 500 years, the Caribbean has experienced devastating tsunamis that have caused incalculable damage (NGI, 2009). Catastrophic events have tended to occur on an average of every 26 years and in the last 170 years, the combined loss of human lives is 3,510, according to available data (Ref: Caribbean Tsunamis, A 500-Year History from 1498-1998 by Karen Fay O'Loughlin and James F. Lander (2003: ISBN 1-4020-1717-0); Tsunamis of the Eastern US, NGDC, 2002 Science of Tsunami Hazards, vol. 20, #3, pg 120; PRSN on Haiti, 2010)

Although tsunamis are not the major natural hazard in the Caribbean, they have the potential to produce catastrophic regional disasters (O'Loughlin and Lander, 2006), and thereby slow down the economic development in this region heavily dependent on its natural environment. With growing populations and a concentration of infrastructure – much of which is linked to tourism – along vulnerable coastlines, the risk exposure which the Caribbean region faces without a coordinated and comprehensive tsunami mitigation programme is magnified.

Experience has shown in such tsunami-prone basins, the most effective Tsunami Early Warning System (TEWS) requires a Tsunami Warning Centre (TWC) staffed with the latest tsunami science coupled with both historical and potential tsunami threat expertise within their home major basin (e.g. Atlantic, western Atlantic etc.). No greater threat to life exists than from the short-fused tsunami where it becomes more imperative than ever that the TWC issues the appropriate language and culturally designed alert(s) with life-saving information utilizing both, maximum speed message distribution (e.g. satellite etc.), and tone-alerting receivers available to all Member Nations, their points of contacts, first responders etc.

The Tsunami Information Centre (TIC), is also an important component involving primarily tsunami outreach, preparedness (TsunamiReady) and education provided in a culturally and language sensitive manner.

For an effective Tsunami Early Warning System (TEWS), these two components, a TWC and a TIC are critical to the protection of life from what is one of nature's most horrific killers. TEWS requires earth monitoring and detection, tsunami science and research, major basin expertise, applications of all these towards the tsunami warning decision that is close to immediate, followed by timely updates, culturally and language sensitive text with response guidance. However, the best tsunami mitigation expertise and service is for naught without the investment by the sovereign Member States in education, preparedness, risk assessment, and practice.

Implementation of an end-to-end maximum effective TEWS for the Western Atlantic, and Caribbean and Adjacent Regions requires a permanent Caribbean Tsunami Warning Centre and the establishment of a Caribbean Tsunami Information Centre (CTIC) efficiently serving as an information resource from which Member State government agencies, public and private stakeholders at all levels, and the general public can draw upon to protect life and serve their State's economic well-being.

2.0 CTIC GOAL

The goal of the CTIC is to improve all aspects of tsunami warning and mitigation including hazard assessment, warnings, preparedness and research.

3.0 CTIC MISSION

The overall mission of the CTIC is to mitigate the effect of tsunamis throughout the Caribbean and adjacent regions.

4.0 CTIC PURPOSE

i. Monitor the effectiveness of the tsunami warning system and recommend improvements with regard to communications, data networks, data acquisition, data processing, tsunami forecasting methods, and information dissemination in conjunction with the designated regional warning centre and with such national warning systems that exist;

ii. Bring to regional and national stakeholders knowledge on tsunami warning systems, and on how to become active participants in the activities of the ICG/CARIBE EWS;

iii. Assist national stakeholders in the establishment of warning and mitigation systems, and the improvement of tsunami preparedness for all through the implementation of comprehensive mitigation programmes in risk assessment, warning guidance and emergency response, and education and awareness;

iv. Act as a technical resource for strengthening both the technical and institutional aspects of the ICG/CARIBE EWS, in addition to fostering research and its application to prevent loss of life and minimize damage to property;

v. Act as an information resource providing for the development, publication, and distribution of educational and preparedness materials on tsunamis and tsunami hazards; and

vi. Act as an information resource on tsunami events, cooperating with the World Data Centre for Solid Earth Geophysics and the ITIC in collecting and making available through appropriate channels all records pertaining to tsunami events, and assisting national authorities in making investigations of all aspects of major tsunamis, including the development of standard survey procedures for such investigations;

vii. Support Member States in the preparation and conduction of regional and national exercises.

The functions and specific activities of the CTIC are included as **Annex I**.

5.0 THE ROLE OF CTIC BOARD

It is envisioned that the CTIC Board will provide oversight for the operations and activities of the CTIC, thus facilitating regional ownership and ensuring the sustainability of the CTIC as the principal institution with responsibility for tsunami mitigation throughout the Caribbean and adjacent regions.

6.0 RESPONSIBILITIES OF THE CTIC BOARD

The responsibilities of the CTIC Board have been defined as follows:

i. Provide strategic guidance to ensure the sustainable management, and operations of the CTIC, including the mobilisation of resources;

ii. Provide overall oversight for the implementation of the CTIC Work Plan activities and production of materials;

iii. Conduct periodic monitoring of the implementation of CTIC activities through the review and approval of quarterly progress reports submitted by the CTIC Director;

iv. Ensuring that the financial control and audit mechanisms of the CTIC are executed in accordance with the applicable UNESCO or host country rules as indicated in the host agreement; and

v. Provide input into annual work plans, budgets and implementation schedules for CTIC activities prior to ratification by the ICG/CARIBE EWS.

7.0 COMPOSITION OF THE CTIC BOARD

The CTIC Board shall be comprised of key representatives of the ICG/CARIBE EWS, IOC/UNESCO, its host government and Member States representatives. The CTIC Board will be complemented by regional experts in the areas of Early Warning Systems, Disaster Management, Coastal Zone Management and Information Management in the capacity of Observers. As part of the arrangements for establishing the CTIC through the Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) Project, funded by the Government of Italy and executed by United Nations Development Programme (UNDP) Barbados and the OECS, the UNDP will also be a member of the CTIC until project closure at the end of December 2013. Membership by representatives will be on both permanent and rotational bases.

Specifically, the CTIC Board will be comprised as follows:

Core Members:

Chair, ICG/CARIBE EWS

Representative, IOC/UNESCO

Representative, CTIC Host Government

Representative, UNDP Barbados and the OECS (until 31December 2013)

Representatives (2), ICG/CARIBE EWS Member States, one of which should be the Chairperson (or designate) of Working Group IV.

Observers:

Representative, CTIC Board meetings host country

Director, CTWC, (Manager, Caribbean Tsunami Warning Program pending the establishment of the CTWC)

Representatives (2), donor agencies

Representatives (2), partner agencies

CTIC Board Secretariat:

Director, CTIC

*Unless otherwise decided by the ICG/CARIBE EWS, the asterisked representatives will sit for the two-year duration on the Board.

The ICG/CARIBE EWS may invite additional representatives to support the work of the CTIC Board as deemed appropriate. Furthermore, Member State representation on the CTIC Board should reflect the multi-lingual nature and geographical spread of the ICG/CARIBE EWS.

8.0 GENERAL RULES GOVERNING ACTIVITIES OF CTIC BOARD

- Participation of representatives on the CTIC Board shall preclude their potential independent input or contracting for consultant services to implement CTIC activities.
- External evaluation to be decided and organized by ICG/CARIBE EWS.
- Decisions taken by the CTIC Board will be taken by consensus.

The following general administrative provisions are intended to guide the meetings of the CTIC Board:

- It is expected that the CTIC Board will meet at least once per year.
- The CTIC Board will approve quarterly reports and other inter-sessional work by correspondence.
- The quorum for meetings is at least 51% of its core members.

9.0 RESPONSIBILITIES OF THE CHAIRPERSON

Unless otherwise decided by the ICG/CARIBE EWS, the CTIC Board will meet under the chairmanship of the Chair, ICG/CARIBE EWS. The Chair of the CTIC Board will be responsible for:

i. Conducting the meeting;
ii. Ensuring, in collaboration with the CTIC Director, that an accurate summary of each meeting is prepared and forwarded to all members;
iii. Ensuring adequate follow-up on the undertakings of the members of the Board; and
iv. Representing the CTIC Board at official meetings.

10.0 SECRETARIAT OF THE CTIC BOARD

The Director of the CTIC will act as Secretary to the CTIC Board. The Secretary will be responsible for preparing meeting documents in advance of meetings and will ensure that the records of all official meetings are forwarded to Members not later than two weeks after the conclusion of the respective meeting.

11.0 COMMUNICATION

To the extent possible, the exchange of information outside the official CTIC Board meetings and preparation work for the CTIC Board meetings will be conducted through virtual meetings and or email.

12.0 DURATION

The composition of the CTIC Board will be determined by the ICG/CARIBE EWS and shall endure for a maximum of two years, after which the membership of the CTIC Board will be reviewed.

13.0 FUNDING FOR CTIC BOARD MEETINGS

Observers will be expected to fund their travel costs and per diem to facilitate participation in CTIC Board Meetings unless otherwise indicated. Funding to facilitate the participation of core CTIC Board members and the logistical costs of convening CTIC Board meetings will be provided from the CTIC budget.

14.0 MEETING LOCATION

Meetings of the CTIC Board will be convened on a rotational basis among ICG/CARIBE EWS Member States.

Second Session of the Intergovernmental Coordination Group
for Tsunami and Other Coastal Hazards Warning System
for the Caribbean and Adjacent Regions
(ICG/CARIBE EWS-II)

Annex I

Recommendation ICG/CARIBE EWS-II/12

**Caribbean Tsunami Information Centre:
Functions and Activities**

The functions of the CTIC should include to:

1. Monitor the performance and effectiveness of the regional and national tsunami warning activities and seek the cooperation of all stakeholders in improving the system. Activities may include to:

   - Maintain close familiarity with the operations and needs of the designated regional Tsunami Warning Centre (TWC), and work closely with the regional TWC to assist as needed with warning operations improvements.
   - Maintain communications with the designated contacts and focal points for the ICG/CARIBE EWS, and as appropriate, national Tsunami Warning Centres, and national Disaster Management Offices.

2. Serve as an information resource for the availability of technical information required for an effective tsunami warning system. Cooperate with experts to ensure that knowledge of new technology applicable to the warning system is made available to all participants. Activities may include to:

   - Provide, or arrange for, consultative services to stakeholders wishing to develop or improve their warning system capability, and liaison services between international, regional and national stakeholders for planning and development of warning systems;
   - Conduct, or arrange for, assessments of existing facilities and the recommendation of improvements, in such areas as instrument standardization, operational scientific evaluation and interpretation, and real-time communications;
   - Initiate, coordinate, or conduct technical training programmes, workshops, and seminars, dealing with all aspects of tsunami warning and preparedness, taking advantage of national, regional, and international experts to provide and share experiences;
   - Encourage and facilitate a visiting scientist programme, and promote the exchange of scientists among countries;
   - Cooperate with international scientific and professional organizations in the encouragement and application of tsunami research, in the standardization of

tsunami data collection, and the identification of research needed to improve the tsunami evaluation capabilities of the tsunami warning centres;

3. Serve as an information resource for the availability of educational, preparedness, and other awareness materials required for an effective tsunami warning and mitigation system. As needed, activities may include to:

   - Initiate and foster the development and distribution of materials in the local language and context in partnership with national and local agencies and civil society organizations;
   - Initiate and implement national and community level awareness programmes, as are appropriate, for the effective delivery of awareness information in partnership with community stakeholders;
   - Encourage and assist as requested in the development of national social awareness materials for events and institutions, such as museums, memorial events, sign boards and other tsunami event memorials or materials, informative roadside signage or exhibits which remember the damaging aspects of past tsunamis;
   - Encourage the posting of hazard, evacuation, or other interpretative signage to increase public awareness for effective and timely tsunami warning response.

4. Serve as an information resource on tsunami events and other historical information on tsunami warning and mitigation activities nationally and in the region. Activities may include to:

   - Assist the ITIC and the World Data Centre for Solid Earth Geophysics (WDC/SEG) in soliciting and collecting as complete a set as possible of seismic, sea level, and other geophysical and oceanographic records, together with supplementary data and descriptive information for each tsunami event;
   - Support, participate, and widely disseminate tsunami event information, including summaries of tsunamis and publications such as, for example, regional tsunami catalogues, taking advantage of the resources of the ITIC and WDC/SEG;
   - Maintain a tsunami event data file and library on tsunamis sufficient to meet CTIC requirements and responsibilities;
   - Disseminate, or arrange for, regular reports on tsunami warning and mitigation activities from regional and national stakeholders (such as newsletters and/or bulletins).

ANNEX IV

CARIBE WAVE 13 PROPOSAL
CARIBE EWS TSUNAMI EXERCISE

The ICG/CARIBE EWS is proposing to hold its second tsunami exercise, CARIBE WAVE 13, on 20 March 2013. The scenario will be based on an M 8.5 earthquake off the north western coast of Venezuela. This tsunami warning exercise will be patterned after the very successful CARIBE WAVE 11 (IOC/2010/TS/93 Rev.) and the annual LANTEX Atlantic and US Caribbean (as of 2009) Exercises of the National Tsunami Hazard Mitigation Program (NTHMP) of NOAA, as well as exercises held in the Pacific. This Tsunami Exercise is being conducted to assist tsunami preparedness in the Caribbean.

Historical tsunami records from sources such as the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Center (NGDC) show that almost 100 tsunamis have been observed in the Caribbean with 23 impacting the coasts of the region. Potential sources for tsunamis in the region include the faults in the Caribbean, steep shores offshore, subareal and submarine volcanoes, the region east of the Azores Islands, and portions of the continental slope off the US and Canadian coast due to subsea landslides.

Recognizing the need for an early warning system, specially after the lessons learnt from the 2004 Indian Ocean tsunami, the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS) was established in 2005 as a subsidiary body of the Intergovernmental Oceanographic Commission (IOC) of UNESCO with the purpose of providing assistance to all Member States of the region to establish their own regional early warning system. The main objective of the ICG/CARIBE EWS is to identify and mitigate the hazards posed by local and distant tsunamis. The goal is to create a fully integrated end-to-end warning system comprising four key components: hazard monitoring and detection; hazard assessment; warning dissemination; and community preparedness and response.

The Pacific Tsunami Warning Center (PTWC) in Hawaii is the interim tsunami warning service provider for the Caribbean. The West Coast and Alaska Tsunami Warning Center (WCATWC) is currently providing tsunami warning service for the US territories in the Caribbean region.

At the national level, each Member State is responsible for issuing warnings to its own citizens through their Tsunami Warning Focal Points (TWFPs). These warnings are based either on the TWFP's own analysis of the situation, on the advisory messages received from PTWC and WCATWC (and some other sources), or on a combination of both.

The ICG/CARIBE EWS is providing the framework for this exercise as a means for emergency responders in the Caribbean and Adjacent Regions to test and update tsunami response plans.

High levels of vulnerability along the Caribbean coasts as well as the Indian Ocean 2004, Haiti 2010, Chile 2010, and Japan 2011analogies should provide a strong incentive for local jurisdictions to prepare for a tsunami.

This exercise will provide simulated tsunami messages from the PTWC and WCATWC triggered by a hypothetical earthquake located North of Venezuela. Both the PTWC and WCATWC have provided initial modelling for the scenario, which has been shared with

geophysicist in the region. The M 8.5 earthquake is to be located at 13.35N, 69.95W with a rupture area = 300 x 100 km, depth ~ 5-15 km (Figure IV−1).The evenly distributed slip is of 5.26 meters. This is a worst case scenario, as according to Mr Franck Audemard (FUNVISI, Venezuela Pers. Com. 2011), the largest historically recorded earthquake in the this subduction zone has been 7.0. Within three hours most areas of the CARIBE EWS will be impacted, including Bermuda (Figure IV−2). The earthquake of magnitude 8.5 generated waves will impact primarily the coasts north and south of the fault but with observable wave heights also in the Eastern and Western Caribbean (Figure IV−3).

Exercises like this will help the U.S./Canadian Atlantic and Caribbean coasts to be better prepared to respond in the case of a dangerous tsunami. Recent exercises in the Pacific Basin and Northeast Atlantic and US Caribbean have proven effective in strengthening preparedness levels of emergency management organizations.

The proposed objectives of CARIBE WAVE 13 will be to:

- Ensure message transmission from PTWC and WCATWC to the Tsunami Warning Focal Points.
- Test tsunami response plans for those Caribbean Emergency Management Offices (EMOs) that have developed plans, and provide a catalyst for EMOs that have not developed one.
- Coastal EMOs review, discuss, and evaluate the various communication alternatives for receiving and disseminating tsunami messages.
- Coastal EMOs review, discuss, and evaluate potential response actions and challenges.
- Identify processes to issue local all-clear notices.

The manual will be available in English. Additional funding will have to be sought to make the exercise manuals also available in Spanish and French (as for the CARIBE WAVE 13). It will include suggested actions as well as a description of the scenario, the timetable, travel times and expected wave heights, figures and samples of the messages that would be issued for such an event and an evaluation questionnaire.

Timetable for CARIBE WAVE 13:

- First Draft Circulated: 1July 2013
- Second Draft Circulated among TNC/TWFP of ICG/CARIBE EWS: 1 September 2013
- Final Exercise Manual Available online: 1 November 2013
- Webinars: Mid-January/February 2013
- Exercise: 20 March 2013
- Exercise Evaluation Questionnaires due: 1 April 2013
- Final CARIBE WAVE 13 report: ICG/CARIBE EWS-VIII

As for the CARIBE WAVE 13, a special Task Team will be formed to coordinate the exercise; it is proposed that the members of this team will be:

- Chair of CARIBE EWS,
- Chairs of Working Group 1, 2, 3 and 4,
- Manager of Caribbean Tsunami Warning Program,

- Director of Caribbean Tsunami Information Centre,
- Director of Pacific Tsunami Warning Center,
- Director West Coast and Alaska Tsunami Warning Center,
- Director of CDEMA,
- Director of CEPREDENAC,
- Technical Secretary of the ICG-CARIBE EWS

For CARIBE WAVE 11, the Task Team was chaired by the Manager of the Caribbean Tsunami Warning Program. This team will work closely with the Team of the National Tsunami Hazard Mitigation Program (NTHMP) of United States of America established for the LANTEX 2013 Exercise.

The following recommendations from the CARIBE WAVE 11 exercise should be taken into consideration:

- Confusion with the terms for alert (translation of terms and difference between PTWC and WCATWC products).
- More detail on impacts, injects.
- Arrival times for all Forecast Points of CARIBE EWS, irrespective of impact.
- Webinars were considered useful for the organization of the Exercise.
- The emails that were sent with the products throughout the exercise were also very helpful.
- Alternatives need to be identified at the local level for the reception and dissemination of messages.
- Improvements could be made to the questionnaires for the final evaluation.

In addition, the IOC has prepared the manual “How to plan, conduct and evaluate tsunami exercises” (IOC/2011/MG/58) which will also be a useful resource. The draft version of the manual is available in English and Spanish.

Decisions that will need to be taken at the ICG/CARIBE EWS-VII:

1. Date and time of the Exercise.
2. Scenario of the Exercise.
3. Task Team members and leader.
4. Approval of timeline.
5. Other Issues:
    a. Website.
    b. Registration to participate.
    c. Local and national participation.
    d. Specific Objectives.

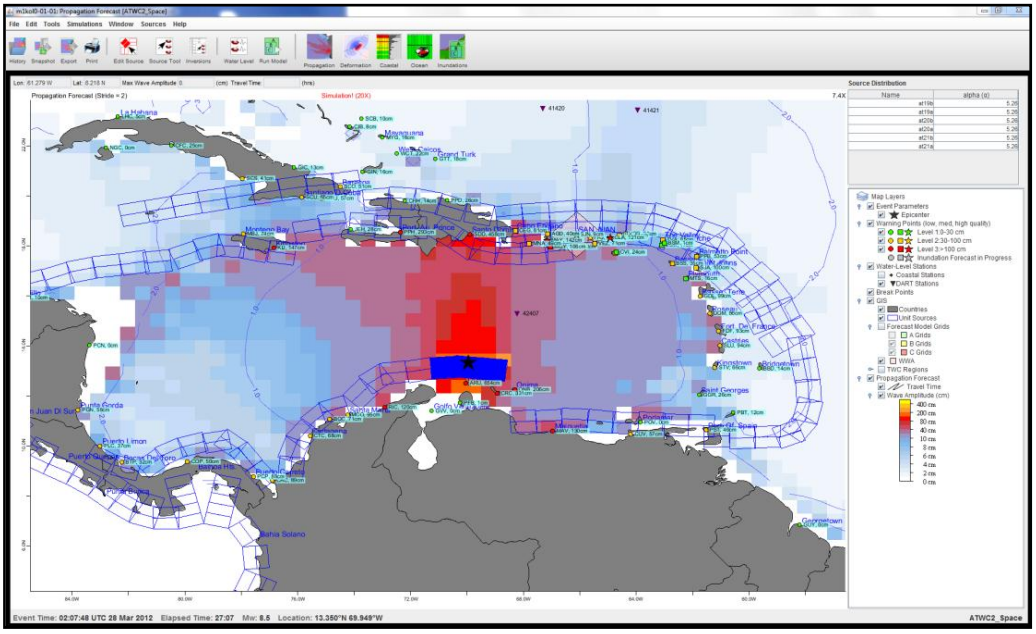

Figure IV−1.Short term inundation forecast graphic with the EQ source highlighted in blue (Kara Sterling, US NWS WCATWC)

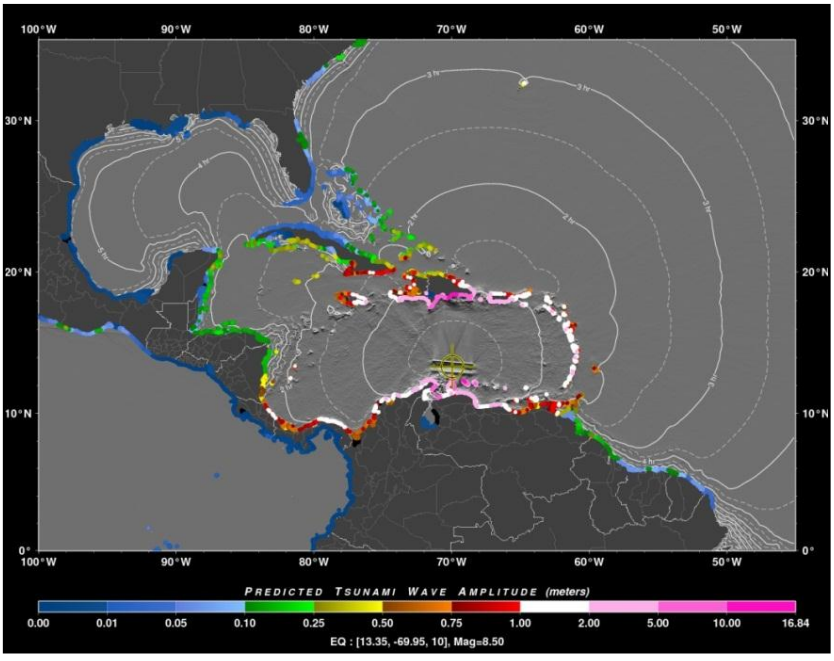

Figure IV−2. RIFT (Rapid Inundation Forecasting of Tsunamis) graphic with the travel times and coastal amplitude heights of the tsunamis (Charles McCreery, US NWS PTWC)

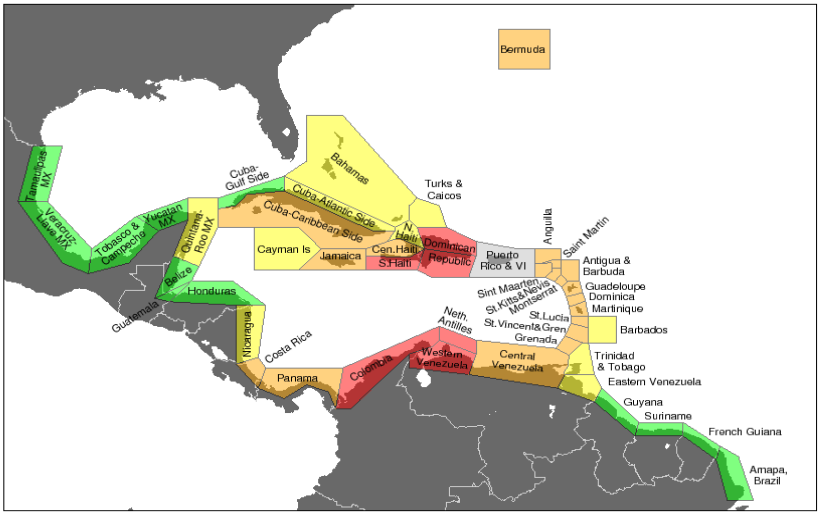

Figure IV−3. CARIBE EWS Proposed Forecast Polygons
(Dr Charles Mc Creery, US NWS PTWC)

ANNEX V

OPENING SPEECHES

Dr Lorna Inniss
Chair of the ICG/CARIBE EWS

Honourable Mr Hensley Keoiman, Minister of Social Affairs, Labour and Welfare, distinguished members of delegations, observers, members of the media, ladies and gentlemen.

It gives me great pleasure to be among the first to welcome you to the Seventh session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions. And thanks to the generosity and demonstrated commitment of officials here in Curacao, we are meeting here in one of the Caribbean's many astonishingly beautiful small islands. Minister, please convey our sincere thanks to your Cabinet colleagues for agreeing to host our meeting here. It has been a real pleasure working with Dr Albert Martis during the last few months as we prepared for this meeting, and we appreciate his willingness to work with us on requirements for the session, as well as his dedication to the goals and aspirations of the ICG, not just for his own country, but for other states of the ICG as well.

Ladies and Gentlemen, I believe that we are in what I term a review phase of the early warning system in the Caribbean. Challenges across the globe are increasingly impacting the work of the ICG in developing our tsunami warning system. UNESCO itself, in spite of major challenges experienced during the past year, has fought to minimize the impact of those challenges on the ICGs, and I wish to commend the staff of the Tsunami Unit, especially Mr Thorkild Aarup and our beloved Technical Secretary, Mr Bernardo Aliaga, for their dedication to our cause, under the most trying of circumstances.

As I reviewed our own actions, I have been pleased to note that accomplishments have been significant and steady from the very first ICG held in Barbados way back in 2006. Permit me to briefly reminisce over the last six and a half years, so that we can appreciate how far we have come. I promise not to weary you right at the start of the meeting with details of how our implementation plan has been achieved during that period. But when I recall the uncertainty expressed by many of our colleagues across Member States, as well as an uncertainty that I felt myself during the first few years, not about our mission or its seriousness – that was clear – but about our ability to achieve it, I can only offer commendations to all of you, the Member States and partners of the ICG/CARIBE EWS. I can still remember the days when even the acronyms associated with the warning system were largely unknown, when the Government of the United States sponsored travel for us to see first-hand how the Pacific system worked and how its institutions functioned so that we could understand what was needed in our own region.

Having come this far, and having a better understanding of the scale of the system requirements, I can now verbally admit to my own doubts and fears that we would make it this far. In the days when the region's sea-level network development lagged far behind the seismic network, when funding for development of warning protocols and public education outpaced what was available for hazard assessment, in the dead of night, I wondered "will we ever manage to accomplish this program that we have set ourselves?" In spite of the uncertainty, I was always conscious that, when dealing with the survival of human beings, failure was not an option.

In some cases, the advancements have been slow and incremental, but progress of development has never ceased, and this alone is cause for thanks today. As windows of opportunity closed after the immediate memory of real events faded, funding would diminish, calling into question the sustainability of our system over time. But as more and more Member States actively joined the fight, we have seen an even greater level of commitment and determination at the national levels. And as a result, during the periods of greatest challenge, we have experienced the same level of implementation, or more. And this sustained growth is due to you, the Member States, observers and partners of the ICG/CARIBE EWS, and I wish to commend you today, and stress that we need to maintain the strong feelings of partnership among us.

Last year, we were basking in the success of our first ever tsunami simulation exercise across the entire basin, and this year, we have yet another first to celebrate. You will be hearing more about this initiative. The first ever non-US/Joint IOC TsunamiReady recognition was conferred on the British Caribbean Territory of Anguilla in a ceremony on the island on 12 December 2011. And I would like to recognize the leadership of Vice-chair Christa von Hillebrandt of the Caribbean Tsunami Warning Program, as well as Ms Elizabeth Klute, who at that time, were the drivers of this initiative. The Caribbean is very proud to have achieved this level of preparedness and resilience in one of our smallest and most vulnerable islands. And we expect that other countries will be following soon.

Just last month, we had the privilege of attending the one-year anniversary symposium and study tour following the Great East Japan Earthquake and Tsunami of March 2011. And we were sobered as we listened to researchers review every aspect of their system, from the science to the population's response, in an effort to understand how they could limit loss of life. As we viewed areas devastated by the event, and efforts to regain normalcy and equilibrium, I was struck again by the scale of the task before us in the Caribbean.

And so today, for the challenges we have overcome, for the capacity built so we could understand the scale of the task before us, for the spirit of collaboration developed among politically, culturally and economically diverse Member States, for those willing to give above and beyond their share to contribute to the system's architecture for the greater good of the region, I thank you personally, as outgoing Chairperson, and on behalf of my country, Barbados.

Mr Albert Martis
Director of the Meteorological Department of Curacao

Minister Koeiman,
Mr Cesar Toro, IOC Secretary for IOCARIBE,
Mr Bernardo Aliaga, Technical Secretary for ICG/CARIBE EWS,
Ms Lorna Inniss, Chairperson of ICG/CARIBE EWS,
Ms Marva Browne, Secretary General UNESCO Curacao
Representatives of the news media,
Dear Invitees,

Today we are going to commence the Seventh ICG meeting of the IOC/UNESCO in the Caribbean. After the lessons learned from the 2004 Indian Ocean tsunami, several Intergovernmental Coordination Groups were established around the world, to provide resourceful assistance on tsunami risk reduction to Member States in the Caribbean Region, in accordance with the IOC 23rd Assembly decision.

Delegates of several countries consisting of experts in the field of seismology, oceanography, meteorology, and disaster risk reduction are here today to continue the discussion on how we are going to prepare our communities for a tsunami and other coastal hazards and, as a result, reducing fatalities and property loss. Therefore we are very happy and privileged to host the Seventh Session of the ICG in Curacao, with a group of excellent experts in their fields.

As a tsunami will impact a whole region, cooperation among the countries by establishing regional networks, data exchange between the countries, information exchange of best practices, technical assistance will be crucial to capacitate the countries evenly for their task.

In this context, there will be some challenges but also great opportunities for all the countries and communities of the region. International cooperation, as it is the spirit of the WMO, has propelled great advances in meteorology in the past few decades. I am convinced that this is also the case for IOC/UNESCO and other UN Agencies.

In conclusion, I want to welcome you all to Curacao and to the Seventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions. That we will continue executing the implementation plan until our communities and countries are TsunamiReady.

Let's live our dream, protecting life with passion!

Thanks to all of you for your attention!

Mr Charles Cooper
Minister of Traffic, Transport and Urban Planning
Government of Curacao

IOC VIP,
Mr Cesar Toro, IOC Secretary for IOCARIBE,
Mr Bernardo Aliaga, Technical Secretary for ICG/CARIBE EWS,
Ms Lorna Inniss, Chairperson of ICG/CARIBE EWS,
Ms Marva Brown, National Secretary General of UNESCO,
Mr Albert Martis, Director Meteorological Department Curacao,
Representatives of the news media,
Dear Invitees,

On behalf of the Government of Curacao and myself as Minister of Traffic, Transport and Urban Planning, I want to welcome you all to Curacao and to the Seventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions.

I am in particular pleased that today you, as delegates of your countries, continue with your deliberations as a region, under the leadership of the IOC/UNESCO, on how to address the threats that a tsunami poses for our communities.

Your presence here greatly enhances this occasion.

After the tsunami event in the Indian Ocean in 2004, killing about 240,000 people, it became clear that great effort has to be made to increase the awareness of this natural phenomenon and on how reduce both the human fatalities and property losses. And, as I understood,

several Intergovernmental Coordination Groups were established by the IOC/UNESCO around the world to address this challenge. Cooperation among nations also will bring new opportunities for the countries.

As you know, after the Tsunami in the Indian Ocean there were several other devastating tsunami events around the world that caused lots of fatalities:

2006 in Java island, a 2-6 meters tsunami killed about 800 people.
2008 in Solomon island, a 12 meters tsunami killed about 50 people.
2009 in Samoa, a 14 meters tsunami killed about 190 people.
2010 at the coast of Chile, about 500 people were killed by a tsunami.
2011 near Japan, a 10-20 meters tsunami caused 20,000 fatalities.

These tsunamis were generated by earthquakes of magnitude 7 to 9.

In this context, the devastating earthquake with a magnitude of 7 in Haiti in 2010, where also a local tsunami warning was issued, strongly reminds us that a tsunami event is also possible in our region.

Therefore, your work in the area of risk management is of tremendous value for the protection of people at risk in the countries in our region. While fatalities will occur, saving all of people at risk should be our aim. Although based on the spectrum of the culture in our region, implying certain challenges, I am very pleased with the advances that you have reached in our region by focusing on protection of life and property. Cooperation among nations will bring new opportunities for the countries.

Therefore, on behalf of the Government of Curacao and the people, I would like to use this opportunity to extend our sincerest appreciation to the IOC/UNESCO and the ICG Members for the commitment that they have shown.

In conclusion, I wish to welcome you again and wish you plenty in-depth discussions in the session, with the objective to develop high-quality risk reduction plans and SOPs for our communities. In addition, I wish you an enjoyable stay on our island and hope you can get a glimpse of our beautiful island during your stay. Furthermore, I want to stress that you can always continue to count on my support as the Minister of Traffic, Transport and Urban Planning for the further improvement of this endeavour.

Thanks to all of you for your attention!

Haitian Delegation
On behalf of the Government of the Republic of Haiti

Thank you Madame President,

The Haitian Delegation gives compliments to Curacao and all who contributed to the achievement of the Seventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions for the Early Warning System for Tsunami and Other Coastal Hazards. She congratulates all Member States of the Intergovernmental Coordination Group for their work achieved during three days there, and encourages them to continue to make efforts through the chain of Tsunami Warning to mitigate or reduce the risk of loss of life in the region.

Since 2008, Haiti has been participating in meetings of the Intergovernmental Coordination Group. However, the event of 12 January 2010 accelerated the process of its involvement in the implementation of the Tsunami Warning System.

From our side, we will continue:

- Strengthening infrastructure at the National Meteorological Centre, Tsunami Warning Focal Point.

- Finalizing the seismic monitoring network under the responsibility of the Bureau of Mines and Energy.

- Installing two other gauges by the Maritime and Navigation Service of Haiti, monitoring the sea and disseminating information across the country.

- Developing the campaign of preparedness and response, awareness and civic education on tsunami and seismic hazards by the Directorate of Civil Protection and the Haitian Red Cross in coastal areas.

- Ensuring our participation as an observer at CTIC.

On behalf of the Government of the Republic of Haiti, once again, Members of the Haitian Delegation would like to thank the Government of Curacao, UNESCO, NOAA, CDEMA, DIPECHO, the Puerto Rico Seismic Network, the Caribe Tsunami Warning Program, the International Tsunami Information Centre, and all who, in one way or another, are helping to develop the Tsunami and Other Coastal Hazards Early Warning System in Haiti.

THANK YOU.

ANNEX VI

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ANNEX VII

LIST OF DOCUMENTS

Working Documents

Doc. No	Document title
ICG/CARIBE EWS-VII/1	Provisional Timetable (English only)
ICG/CARIBE EWS-VII/2	Report of the Caribbean Tsunami Information Centre (CTIC) (English only)
ICG/CARIBE EWS-VII/3	Seventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
ICG/CARIBE EWS-VII/4	Draft Business Plan 2012–2016 for the Caribbean Tsunami Information Centre (CTIC) (English only)
ICG/CARIBE EWS-VII/5	Draft Terms of Reference Caribbean Tsunami Information Centre (CTIC) Board(English only)
ICG/CARIBE EWS-VII/6	PTWC Report for CARIBE EWS-VII (English only)
ICG/CARIBE EWS-VII/7	Status Report WG1 on Monitoring and Detection Systems, Warning Guidance for the ICG/CARIBE EWS-VII (English only)
ICG/CARIBE EWS-VII/8	Report of Working Group 1 on Monitoring and Detection Systems, Warning Guidance (English only)
ICG/CARIBE EWS-VII/9	Report of Working Group 2 on Hazard Assessment (English only)
ICG/CARIBE EWS-VII/10	Report of Working Group 3 on Warning Dissemination and Communication (English only)
ICG/CARIBE EWS-VII/11	Report of Working Group 4 on Preparedness, Readiness and Resilience (English only)
ICG/CARIBE EWS-VII/12	Fact Sheet Working Group 1 on Monitoring and Detection Systems, Warning Guidance (English only)
ICG/CARIBE EWS-VII/13	Fact Sheet Working Group 2 on Hazard Assessment (English only)
ICG/CARIBE EWS-VII/14	Fact Sheet Working Group 3 on Warning Dissemination and Communication (English only)

ICG/CARIBE EWS-VII/15	Fact Sheet Working Group 4 on Preparedness, Readiness and Resilience (English only)
ICG/CARIBE EWS-VII/16	Presentation CARIBE WAVE 2013 (English only)
ICG/CARIBE EWS-VII/17	Proposal of CARIBE WAVE 2013, a CARIBE EWS Tsunami Exercise (English only)
ICG/CARIBE EWS-VII/18	Report of the Intra-Sessional Working Group on New Tsunami Products for the CARIBE EWS-VII (English only)
IOC Technical Series 73	CARIBE EWS Implementation Plan (English only)
ICG/CARIBE EWS-II/11	Communications Plan for the Interim Tsunami Advisory Information Service to the Caribbean Sea and Adjacent Regions (English only)

Information Documents

Doc. No	**Document title**
ICG/CARIBE EWS-VII/Inf.1	Chairman's Report (English)
ICG/CARIBE EWS-VII/Inf.2	ICG CARIBE EWS Secretariat's report (English only)
ICG/CARIBE EWS-VII/Inf.3	UNDP Barbados and the OECS DRR Initiatives to Address Coastal Hazards Presentation (English only)
ICG/CARIBE EWS-VII/Inf.4	Puerto Rico Seismic Network (PRSN) Report (English only)
ICG/CARIBE EWS-VII/Inf.5	Report of the WMO Marine Programme (English only)
IOC/BRO/2012/1	Summary Statement from the Japan – UNESCO/UNU Symposium on The Great East Japan Tsunami on 11 March 2011 and Tsunami Warning Systems: Policy Perspectives 16-17 February 2012, United Nations University, Tokyo, Japan(English only)
ICG/CARIBE EWS-VII/Inf.6	Vice Chair of IOC in charge of TOWS-WG Report on TOWS-V and Tsunami Symposium in Tokyo, Feb. 15-17, 2012 (English only)
ICG/CARIBE EWS-VII/Inf.7	National Report Colombia 2012 (Spanish only)
ICG/CARIBE EWS-VII/Inf.8	National Report of Trinidad and Tobago 2012 (English only)
ICG/CARIBE EWS-VII/Inf.9	National Report of United States of America 2012

	(English only)
ICG/CARIBE EWS-VII/Inf.10	National Report British Virgin Islands 2012 (English only)
ICG/CARIBE EWS-VII/Inf.11	National Report Dominican Republic 2012
ICG/CARIBE EWS-VII/Inf.12	National Report Aruba 2012
ICG/CARIBE EWS-VII/Inf.13	National Report France 2012
ICG/CARIBE EWS-VII/Inf.14	National Report St. Kitts and Nevis 2012
ICG/CARIBE EWS-VII/Inf.15	National Report St. Lucia 2012
ICG/CARIBE EWS-VII/Inf.16	Dominican Republic Report “Acción Tsunami” (Spanish only)
ICG/CARIBE EWS-VII/Inf.17	Report of the Government of Anguilla “First International TsunamiReady Community” (English only)
ICG/CARIBE EWS-VII/Inf.18	UNESCO IOC CARIBE EWS and NOAA NWS Caribbean Pilot Project for the Regional Implementation of the TsunamiReady Program (English only)
ICG/CARIBE EWS-VII/Inf.19	Application Form Caribbean Pilot Project for the Regional Implementation of the TsunamiReady Program (English only)
ICG/CARIBE EWS-VII/Inf.20	Guidelines of Caribbean Pilot Project for the Regional Implementation of the TsunamiReady Program (English only)

Background Documents

Doc. No	**Document title**
ICG/CARIBE EWS-VII/Rep._1	Hosting Agreement ICG CARIBE EWS VII – Curacao (English only) ICG/CARIBE EWS Organizational Structure and Governance (English only)
IOC/2011/MG/58	How to plan, conduct and evaluate tsunami exercises (Draft) (English/ Spanish)
ICG/CARIBE EWS-II/12	A Caribbean Tsunami Information Center: Roles and Functions for the Implementation of an Effective Tsunami and Coastal Hazards Warning and Mitigation System (English only)

IOC/TOWS-WG-IV/3	Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Fourth Meeting, UNESCO Headquarters, Paris, France, 21-22 March 2011 (English only)
IOC Technical Series 90	12 January 2010 Haiti earthquake and tsunami event: post-event assessment of CARIBE EWS performance (English only)
IOC/CL-2416	URGENT: financial situation of UNESCO and the IOC and Programme and budget for 2012–2013 (36 C/5) (English/French)
IOC/CL-2426	Update on the status of the IOC Programme and Budget for 2012–2013 (36 C/5) (English/French)
IOC/CL 2423	Letter of Invitation to ICG/CARIBE EWS-VII (English)
ICG/CARIBE EWS-VI/3	Summary Report of the Sixth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-VI), Santo Domingo, Dominican Republic, 26–29 April 2011 (English only)

ANNEX VIII

LIST OF ACRONYMS

ACP-EU-GFDRR	Africa Caribbean Pacific - European Union Global Facility for Disaster Reduction and Recovery
AOR	Area of Responsibility
AusAID	Australian Government Overseas Aid Program
CDEMA	Caribbean Disaster Emergency Management Agency
CEPREDENAC	Coordination Centre for the Prevention of Natural Disasters in Central America
cGNSS	continuous Global Navigation Satellite System
CIMH	Caribbean Institute for Meteorology and Hydrology
COMET	Cooperative Program for Operational Meteorology, Education and Training
ComMIT	Community Model Interface for Tsunami
CTWP	Caribbean Tsunami Warning Programme
CZMU	Coastal Zone Management Unit of Barbados
DART	Deep-ocean Assessment and Reporting of Tsunamis Project
DEM	Department of Emergency Management
DIPECHO	Disaster Preparedness of the European Commission Humanitarian Aid Department
DMC	Data Management Center
EMO	Emergency Management Office
EMWIN	Emergency Managers Weather Information Network of United States of America
FUNVISIS	Fundación Venezolana de Investigaciones Sismológicas
GEM	Global Earthquake Model
GIFS	GTS Internet File Service
GISC	Global Information System Centre
GOES	Geostationary Operational Environmental Satellite (US/NOAA)
GTS	Global Telecommunication System
ICG	Intergovernmental Coordination Group
ICG/CARIBE EWS	Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
IOC	Intergovernmental Oceanographic Commission
IRIS	Incorporated Research Institutions for Seismology
ISU	Seismological Institute of Dominican Republic

ITIC	International Tsunami Information Centre
MOST	Method of Splitting Tsunami
NEAMTWS	Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas
NESDIS	National Environmental Satellite, Data, and Information Service
NOAA	National Oceanic and Atmospheric Administration of United States of America
NTHMP	National Tsunami Hazard Mitigation Program
OCT	Overseas Countries and Territories
OECS	Organization of Eastern Caribbean States
ONAMET	Oficina Nacional de Meteorología de la República Dominicana
PAE	Public Awareness and Education
PRSN	Puerto Rico Seismic Network
PTWC	Pacific Tsunami Warning Center
RTSPs	Regional Tsunami Service Providers
SELFE model	Semi-implicit Eulerian–Lagrangian finite-element model for cross-scale ocean circulation
SHOM	French Naval Hydrographic and Oceanographic Service
SOP	Standard Operating Procedure
SRC	Seismic Research Center
TNC	Tsunami National Contact
TOR	Terms of Reference
TT	Task Team
TWFP	Tsunami Warning Focal Point
UHSLC	University of Hawaii Sea-Level Centre
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNU	United Nations University
USGS	United States Geological Survey
WCATWC	West Coast and Alaska Tsunami Warning Center
WG-TOWS	Tsunamis and Other Hazards Related to Sea-level Warning and Mitigation Systems
WIFS	World Area Forecast System Internet File Service
WMO	World Meteorological Organization

In this Series *Languages*

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

1.	Eleventh Session of the Working Committee on international Oceanographic Data Exchange	E, F, S, R
2.	Seventeenth Session of the Executive Council	E , F, S, R,Ar
3.	Fourth Session of the Working Committee for Training, Education and Mutual Assistance	E, F, S, R
4.	Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S, R
5.	First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E, F, S
6.	Third Session of the *ad hoc* Task team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime	E, F, S, R
7.	First Session of the Programme Group on Ocean Processes and Climate	E, F, S, R
8.	Eighteenth Session of the Executive Council	E, F, S, R, Ar
9.	Thirteenth Session of the Assembly	E, F, S, R, Ar
10.	Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	
11.	Nineteenth Session of the Executive Council, Paris, 1986	E, F, S, R, Ar
12.	Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S
13.	Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange	E, F, S, R
14.	Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Havana, 1986	E, F, S
15.	First Session of the IOC Regional Committee for the Central Eastern Atlantic, Praia, 1987	E, F, S
16.	Second Session of the IOC Programme Group on Ocean Processes and Climate	E, F, S
17.	Twentieth Session of the Executive Council, Paris, 1987	E, F, S, R, Ar
18.	Fourteenth Session of the Assembly, Paris, 1987	E, F, S, R, Ar
19.	Fifth Session of the IOC Regional Committee for the Southern Ocean	E, F, S, R
20.	Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987	E, F, S, R
21.	Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Arusha, 1987	E, F
22.	Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987	E only
23.	Twenty-first Session of the Executive Council, Paris, 1988	E, F, S, R
24.	Twenty-second Session of the Executive Council, Paris, 1989	E, F, S, R
25.	Fifteenth Session of the Assembly, Paris, 1989	E, F, S, R
26.	Third Session of the IOC Committee on Ocean Processes and Climate, Paris, 1989	E, F, S, R
27.	Twelfth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Novosibirski, 1989	E, F, S, R
28.	Third Session of the Sub-Commission for the Caribbean and Adjacent Regions, Caracas, 1989	E, S
29.	First Session of the IOC Sub-Commission for the Western Pacific, Hangzhou, 1990	E only
30.	Fifth Session of the IOC Regional Committee for the Western Pacific, Hangzhou, 1990	E only
31.	Twenty-third Session of the Executive Council, Paris, 1990	E, F, S, R
32.	Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, New York, 1990	E only
33.	Seventh Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment, Paris, 1991	E, F, S, R
34.	Fifth Session of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Paris, 1991	E, F, S, R
35.	Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991	E, F, S, R
36.	Twenty-fourth Session of the Executive Council, Paris, 1991	E, F, S, R
37.	Sixteenth Session of the Assembly, Paris, 1991	E, F, S, R, Ar
38.	Thirteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Baja California, 1991	E, F, S, R
39.	Second Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1992	E only
40.	Twenty-fifth Session of the Executive Council, Paris, 1992	E, F, S, R
41.	Fifth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1992	E, F, S, R
42.	Second Session of the IOC Regional Committee for the Central Eastern Atlantic, Lagos, 1990	E, F
43.	First Session of the Joint IOC-UNEP Intergovernmental Panel for the Global Investigation of Pollution in the Marine Environment, Paris, 1992	E, F, S, R
44.	First Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1992	E, F, S
45.	Fourteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 1992	E, F, S, R
46.	Third Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Vascoas, 1992	E, F
47.	Second Session of the IOC Sub-Commission for the Western Pacific, Bangkok, 1993	E only
48.	Fourth Session of the IOC Sub-Cornmission for the Caribbean and Adjacent Regions, Veracruz, 1992	E, S
49.	Third Session of the IOC Regional Committee for the Central Eastern Atlantic, Dakar, 1993	E, F
50.	First Session of the IOC Committee for the Global Ocean Observing System, Paris, 1993	E, F, S, R
51.	Twenty-sixth Session of the Executive Council, Paris, 1993	E, F, S, R
52.	Seventeenth Session of the Assembly, Paris, 1993	E, F, S, R
53.	Fourteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Tokyo, 1993	E, F, S, R
54.	Second Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1993	E, F, S
55.	Twenty-seventh Session of the Executive Council, Paris, 1994	E, F, S, R
56.	First Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Melbourne, 1994	E, F, S, R
57.	Eighth Session of the IOC-UNEP-IMO Committee for the Global Investigation of Pollution in the Marine Environment, San José, Costa Rica, 1994	E, F, S
58.	Twenty-eighth Session of the Executive Council, Paris, 1995	E, F, S, R
59.	Eighteenth Session of the Assembly, Paris, 1995	E, F, S, R
60.	Second Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E, F, S, R

61.	Third Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1995	E only
62.	Fifteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Papetee, 1995	E, F, S, R
63.	Third Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1995	E, F, S
64.	Fifteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange	E, F, S, R
65.	Second Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E only
66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	E only
67.	Fifth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Christ Church, 1995	E, S
68.	Intergovernmental Meeting on the IOC Black Sea Regional Programme in Marine Sciences and Services	E, R
69.	Fourth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, 1995	E, F, S
70.	Twenty-ninth Session of the Executive Council, Paris, 1996	E, F, S, R
71.	Sixth Session for the IOC Regional Committee for the Southern Ocean and the First Southern Ocean Forum, Bremerhaven, 1996	E, F, S,
72.	IOC Black Sea Regional Committee, First Session, Varna, 1996	E, R
73.	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Fourth Session, Mombasa, 1997	E, F
74.	Nineteenth Session of the Assembly, Paris, 1997	E, F, S, R
75.	Third Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1997	E, F, S, R
76.	Thirtieth Session of the Executive Council, Paris, 1997	E, F, S, R
77.	Second Session of the IOC Regional Committee for the Central Indian Ocean, Goa, 1996	E only
78.	Sixteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Lima, 1997	E, F, S, R
79.	Thirty-first Session of the Executive Council, Paris, 1998	E, F, S, R
80.	Thirty-second Session of the Executive Council, Paris, 1999	E, F, S, R
81.	Second Session of the IOC Black Sea Regional Committee, Istanbul, 1999	E only
82.	Twentieth Session of the Assembly, Paris, 1999	E, F, S, R
83.	Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1999	E, F, S, R
84.	Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 1999	E, F, S, R
85.	Fourth Session of the IOC Sub-Commission for the Western Pacific, Seoul, 1999	E only
86.	Thirty-third Session of the Executive Council, Paris, 2000	E, F, S, R
87.	Thirty-fourth Session of the Executive Council, Paris, 2001	E, F, S, R
88.	Extraordinary Session of the Executive Council, Paris, 2001	E, F, S, R
89.	Sixth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, San José, 1999	E only
90.	Twenty-first Session of the Assembly, Paris, 2001	E, F, S, R
91.	Thirty-fifth Session of the Executive Council, Paris, 2002	E, F, S, R
92.	Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Lisbon, 2000	E, F, S, R
93.	Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Cartagena, 2001	E, F, S, R
94.	Fifth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2001	E, F, S, R
95.	Seventh Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Mexico, 2002	E, S
96.	Fifth Session of the IOC Sub-Commission for the Western Pacific, Australia, 2002	E only
97.	Thirty-sixth Session of the Executive Council, Paris, 2003	E, F, S, R
98.	Twenty-second Session of the Assembly, Paris, 2003	E, F, S, R
99.	Fifth Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Kenya, 2002 (* Executive Summary available separately in E, F, S & R)	E*
100.	Sixth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, St. Petersburg (USA), 2002 (* Executive Summary available separately in E, F, S & R)	E*
101.	Seventeenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
102.	Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
103.	Nineteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Wellington, New Zealand, 2003 (* Executive Summary available separately in E, F, S & R)	E*
104.	Third Session of the IOC Regional Committee for the Central Indian Ocean, Tehran, Islamic Republic of Iran, 21-23 February 2000	E only
105.	Thirty-seventh Session of the Executive Council, Paris, 2004	E, F, S, R
106.	Seventh Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2005 (* Executive Summary available separately in E, F, S & R); and Extraordinary Session, Paris, 20 June 2005	E*
107.	First Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Perth, Australia, 3–5 August 2005	E only
108.	Twentieth Session of the Intergovernmental Coordination Group for the Tsunami Warning System in the Pacific, Viña del Mar, Chile, 3–7 October 2005 (* Executive Summary available separately in E, F, S & R)	E*
109.	Twenty-Third Session of the Assembly, Paris, 21–30 June 2005	E, F, S, R
110.	First Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Rome, Italy, 21–22 November 2005	E only
111.	Eighth Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Recife, Brazil, 14–17 April 2004 (* Executive Summary available separately in E, F, S & R)	E*
112.	First Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (ICG/CARIBE-EWS), Bridgetown, Barbados, 10–12 January 2006	E only
113.	Ninth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Cartagena de Indias, Colombia, 19–22 April 2006 (* Executive Summary available separately in E, F, S & R)	E S*

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

151.	Twenty-fourth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Beijing, China, 24–27 May 2011 (*Executive Summary in E, F, S & R included)	E*
152.	Twenty-first Session of the IOC Committee on International Oceanographic Data and Information Exchange, Liège, Belgium, 23–26 March 2011 (*Executive Summary available separately in E, F, S & R)	E*
153.	Eighth Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VIII), Bali, Indonesia, 10–13 May 2010 (*Executive Summary available separately in E, F, S & R)	E*
154.	Tenth IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 12–14 April 2011 (* Executive Summary available separately in E, F, S & R)	E*
155.	Forty-fifth Session of the Executive Council, Paris, 26–28 June 2012	E/F/S/R
156.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Willemstad, Curacao, 2–4 April 2012 (* Executive Summary available in E, F, S & R)	E*