RECOMMENDATIONS FOR CARIBE EWS

The Officers and Invited Observers of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS),

Recognising the physical, economic, social and emotional impact of the recent Hurricane Season and other Natural Disasters;

Extending their solidarity to the Member States for the unprecedented impact of Hurricanes Harvey, Irma, Maria and Nate, as well as other recent meteorological events, earthquakes and recognising that many lives were saved thanks to education, preparedness and early warning efforts;

Considering the identified lessons as well as potential additions/improvements to tsunami and other coastal hazards early warning systems;

Recognising the critical role of national, regional and international partnerships spanning all phases of the disaster management continuum within a coordination framework which involves national/local coordination emergency management personnel and coastal communities;

Acknowledging that CARIBE EWS should give some consideration to the integration of mitigation, relief and recovery phases given the high potential for multi-country impacts;

Recommends that this be done through a supportive approach to regional partnership frameworks such as the Caribbean Disaster Emergency Management Agency (CDEMA)-led mechanisms for the advancement of Comprehensive and Integrated Disaster Risk Management including regional response mechanisms characterized by a wide network of specialized actors together with a high level of coordination and comparative advantage;

Further agrees that the CARIBE-EWS Performance Based Tsunami Community Recognition Programme provides a prime conduit for the partnership framework extending to tsunami and other coastal hazards and facilitating further mitigation, relief and recovery phases within the context of the existing Community Based Disaster Management Frameworks;

Notes the on-going real-time independent evaluation of the CDEMA-led regional response to the ICG/CARIBE EWS Member States of Dominica, Barbuda, the British Virgin Islands (UK) to be completed by 31 December, 2017;
Notes the high level of success in the development of the tsunami monitoring and detection system and the gaps and high-level of vulnerability which currently exists as a result of the impacts of 2017 meteorological events and attrition;

Further notes the data utility of the CARIBE-EWS tsunami observation system for other coastal hazards;

Supports current initiatives through NOAA, UNESCO/IOC and Member States to ensure reinstatement of monitoring and detection capacity and recommends that ICG/CARIBE EWS include sea-level data analysis for hurricanes, tsunamis and also coastal hazards in its next sea level training;

Further recommends that Member States ensure reinforced installation (through grounding, protective housing and other techniques) and adequate insurance of local sea level station and seismic data collection networks to ensure resiliency and efficient replacement if necessary post-impact;

Recognises the high level of robustness experienced with the EMWIN system, VHF marine communication, amateur ham radios, FM/AM stations, transistor radios as well as underground electrical installation systems during the recent 2017 meteorological impacts;

Recommend continued emphasis on use of varied, redundant, low-cost equipment and communication methods (e.g. verbal, text) and also encourages Member States to utilise traditional and non-traditional methods as well as digital and analogue systems supported by multiple service providers to ensure robustness during and post impact phases as well as exploring new technologies for enhancing international, regional, national and local communication;

Notes the warning communication reception and dissemination guidelines of the Pilot CARIBE-EWS Performance Based Tsunami Community Recognition Programme as critical in establishing a redundant multi-hazard warning communication platform;

Acknowledges the need for supporting the revitalization of Amateur Ham Radio Operation and further acknowledges the need for continued training in all forms of communications platforms (including Amateur Radio Systems) within Emergency Operation Centre management and requests UNESCO/IOC to mobilise the technical capacities and support of the UNESCO Communication Sector to address this in partnership with existing partners delivering said training to member countries, and with a particular focus on the youth to ensure sustainability;

Notes the capacity of social media networks to be employed for mass communication and requests WG 3 to review the capacity of social media including any challenges and necessary management guidelines for use;

Notes the role of the regional partnership framework in providing a robust warning communication network and recommends Member States to consider designating emergency alternate TWFPs from other Member States as a back-up, in an effort to ensure the efficient dissemination of PTWC enhanced products to threatened Member States should their communication systems between the in country TWFPs and the PTWC be compromised;
Further recommends that consideration be given to the dissemination of the PTWC enhanced products to select regional disaster management organisations with the mandate for regional coordination to ensure enhanced warning communication redundancy for Member States;

Acknowledges the key role of education in empowering populations to respond effectively to and efficiently to the tsunamis, meteorological and other coastal hazards to save lives and property;

Further acknowledges the prime utility of Tsunami Public Awareness and Education Strategy for the Caribbean and Adjacent Regions (Intergovernmental Oceanographic Commission Technical Series 107) for advancing public awareness, education and resilience;

Recognises that the CARIBE-EWS Performance Based Tsunami Community Recognition Programme and the annual CARIBE WAVE Exercise provide platforms for public education and empowerment, particularly in relation to mass self-evacuation and efficient resumption of normalcy post-impact. Also recognises the vital role of the programme for planning and coordination across community, local, municipal and federal levels of government and the adaptability of this approach for multiple hazards. Further recognises the strides made by ONAMET, Dominican Republic to empower communities and schools to work independently for CARIBE WAVE;

Supports the formal integration of disaster risk reduction within the K-12 Curricula, as well as primary and secondary school curriculum for ICG/CARIBE EWS Member States embraced as a cross-cutting theme throughout various subject areas. Notes the ongoing work of the University of the West Indies, the Puerto Rico Seismic Network, lead CDEMA Education Sector Sub-Committee and the advances that some Member States have made in the developments of materials and strategies in this regard;

Recognises the current implementation of the Caribbean Safe Schools Programme core-led by CDEMA, UNIDSR and UNICEF, supported by other partners including UNESCO and its IOC, CTIC and IFRC. Further recognises the piloting of the programme in three (3) schools in St. Kitts and Nevis the success of the vulnerability assessments in highlighting critical potential locational and facility impacts;

Further Recognising the benefits of including Disaster Management in K-12 Curricula, the Caribbean Safe Schools Programme and the advances that some Member States have made in the developments of materials and strategies;

Requests the CTIC to prepare an inventory of K-12 tsunami and other coastal hazard educational materials developed within the Caribbean and Adjacent Regions to be shared among the Member States;

Recommends that the ICG/CARIBE EWS formalizes continued integration of CTIC with the Caribbean Safe School Programme;

Acknowledges the importance of inundation and evacuation maps for increasing preparedness for coastal hazards and further acknowledges that those maps should be based on numerical modeling;

Further recognises the development of Tsunami Evacuations maps by some Member States and recent advances in the development of guidelines.
Recognises that the Pacific Tsunami Warning System (PTWS) through the Essential Tsunami Preparedness: Tsunami Evacuation Maps, Plans, and Procedures (TEMPP) is elaborating evacuation mapping manuals and recommends that the Task Team on Evacuation Mapping continues to review this process (including a literature review) with the view of standardisation of materials.

Encourages the CARIBE EWS Task Team on Evacuation Maps to complete the inventory of guidance materials and consider mechanisms and guidelines for addressing and integrating coastal inundation from other hazards;

Recommends WG2 to explore the integration of other coastal flooding hazards with tsunamis in inundation and evacuation maps.

Recognises that access to nearshore bathymetry is critical for full development of modelling and mapping for CARIBE EWS and highlights the need for guidelines, benchmarking and commonality in methodologies given that the physics modelling is different and impacts may be varied;

Urges that WG2 seeks to identify funding and partners for the required bathymetric data collection;

Noting that the annual CARIBE WAVE is an opportunity to exercise and evaluate the operation of the CARIBE EWS Tsunami and Other Coastal Hazards warning system, encourages Member States to conduct a full test of their communication systems and decide the level of engagement of corresponding agencies, the private sector and the public;

Encourages the development and implementation of building codes throughout ICG/CARIBE EWS Member States, particularly noting the need for a multi-hazard approach.

Recommends that facilities for critical services such as emergency management offices be safe and usable during high impact events;

Appreciating the wide benefits of the CARIBE-EWS Performance Based Tsunami Community Recognition Programme, recommends that the Task Team Tsunami Ready Programme, CTIC and the CTWP continue to support the current pilots and the upcoming submissions for pilots.

Recognises the progress of the Task Team on Procedures to Follow for Volcanic Crises;

Supports the role of the Task Team on Procedures to Follow for Volcanic Crises in refining the process by which the trigger is indicated to the Pacific Tsunami Warning Center (PTWC) to disseminate threat messages to Member States as appropriate;

Notes the potential incorporation of volcanic threats in mapping where relevant, as currently being done with the Tsunami Ready Pilot recognition for Grenada;

Recommends that the Task Team on Procedures to Follow for Volcanic Crises continues its work in refining the trigger process and supporting the identification of plausible scenarios by individual observatories;
Notes the advances of ICG/CARIBE EWS in establishing the Group of Experts for Other Coastal Hazards through the identification of possible conveners. Further notes the need for the group to meet to establish a work plan and select a chair and the potential funding support being prioritised from UNESCO/IOC regular budget for a 2018 meeting;

Appreciates ongoing similar initiatives through the CDEMA-led regional Early Warning Systems Consortium and at the project level with UNDP and IFRC. Further appreciates the role of the Consortium built on the EWS pillars from the CDM Strategy for multi-hazard, more people-centred end-to-end approaches for early warning systems.

Recommends the harmonization of regional efforts through exchange of documents re: vision, goals, concepts, terms of references between the CDEMA-led initiatives and the ICG/CARIBE EWS Group of Experts for Other Coastal Hazards with the potential for the ICG/CARIBE EWS Group to leverage their comparative advantage in support of the strategic intent of the Consortium;

Recognises the assistance already provided by regional network operators in the initial GNSS assessment and requests continued support for this Task Team;

Encourages network operators from Member States to provide high-rate (at least 1Hz), GNSS data streams in real-time (i.e. without delay);

Recommends continued support to ICG/CARIBE EWS XII GNSS recommendations;

Acknowledges the advancements and outstanding initiatives from the current Implementation Plan and the rationalization approach for outstanding matters within the 2019 – 2023 draft;

Notes the draft is to be circulated to the ICG/CARIBE EWS Officers and Observers for input prior to referral to the Task Team prior to consideration and approval at ICG/CARIBE EWS XIII;

Recognises the key social objective of protection of life and livelihoods through the combined partnership approaches with key regional and international partners and consideration of hazards, risk and vulnerability;

Further recognises the integration of monitoring and evaluation approaches through the identification of performance indicators based on the PTWS reference as agreed at the last TOWS meeting;

Agrees that the performance indicators should be collated for both tsunamis and other coastal hazards based on the four elements of the CARIBE EWS; namely Monitoring and Detection Systems, Hazard Assessment, Related Services and Public Awareness, Education and Resilience;

Agrees for ICG/CARIBE EWS XII to be convened in Curacao April 24-27, 2018 with the additional day to support full consideration of a revised agenda and election of Officers.
# ANNEX I - AGENDA

**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**  
(of UNESCO)

**Mid Term Meeting of Officer of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-XII)**  
Santo Domingo, 13-14 November 2017

<table>
<thead>
<tr>
<th>Hour</th>
<th>Monday, November 13</th>
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<th>Tuesday, November 14</th>
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<tbody>
<tr>
<td>8.30 – 9.00</td>
<td>Registration, logistics</td>
<td>8:00-9:00</td>
<td>Breakout Groups/Informal Meetings, Discussions</td>
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| 9.00-11:00 | **1. WELCOME, OPENING AND ORGANIZATION OF THE MEETING**  
Christa von Hillebrandt-Andrade, ICG/CARIBE EWS Chair (Status of ICG Recommendations)  
Bernardo Aliaga, ICG/CARIBE EWS Technical Secretary  
**2. Hurricanes Irma and Maria – Lessons Learnt from Maria**  
2.1 PRSN (Victor Huerfano)  
2.2 British Virgin Islands (UK) (Jasen Penn)  
2.3 CARIBE EWS and NOS – Sea level stations (Christa von Hillebrandt with input from IOCARIBE)  
2.4 Open Discussion and Recommendations for CARIBE EWS | 9.00 – 10.30  
Summary of Previous Day (Christa von Hillebrandt)  
7.- Task Team GNSS update (Karl Feaux)  
8.-Task Team Procedures to follow for volcanic crises (Paul Martens)  
9.-Group of Experts for Other Coastal Hazards (Chair and Secretariat) |
| 11:00-11:30| COFFEE BREAK + Group Photo                | 10:30                 | COFFEE BREAK                                    |
| 11.30-13.00| **3. Early Warning Systems - what could be added/improved**  
3.1- Sint Maarten (Paul Martens)  
3.2. Dominican Republic (TBD)  
3.3. Regional cooperation – CDEMA (Ronald Jackson) and WMO (Edgard Cabrera)  
3.4 Open Discussion and Recommendations for CARIBE EWS | 11.00-13.00  
10.- Implementation Plan 2017-2022 (Milton Puentes)  
11.-Open Discussion  
12. ICG XIII |
| 13.00-14.00| LUNCH BREAK                               | 13.00                 | LUNCH BREAK                                     |
| 14.00-16.00| **4. CARIBE WAVE 18 (Christa G. von Hillebrandt)**  
5. Tsunami Ready Pilot (Claricia Langley and Jasen Penn with input from WG4, CTIC and CTWP)  
6.-TaskTeam Evacuation Maps (Bernardo Aliaga – TEMPP and DIPECHO with input from WG 2) | 14.00-16.00 | 13. Recommendations  
14. Closing of Meeting |
ANNEX II

LIST OF PARTICIPANTS

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