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

Working Group 1 Report

The U.S. has adopted a phased approach to developing a Caribbean Tsunami Warning Center. There are three phases: 1) Enhance tsunami outreach and education capacity in the Caribbean; 2) Strengthen Caribbean Regional Tsunami monitoring; and 3) Establish a Regional Tsunami Warning Center at the University of Puerto Rico Mayaguez. These phases are planning phases, not implementation phases. The results and timing of each phase will determine next steps, including decisions about whether or not to continue the planning process.

On February 1, 2010 NWS established the Caribbean Tsunami Warning Program (http://www.srh.noaa.gov/srh/ctwp), collocated with the Puerto Rico Seismic Network at the University of Puerto Rico in Mayagüez. Currently it is staffed by the Manager and one Student. Plans are underway to hire by Sept. 2011 additional personnel. This is the first step of the U.S. phased deployment of a Caribbean Tsunami Warning Center. The CTWP worked with local, national and international stakeholders and partner to improve tsunami monitoring (Sea Level, Seismic and GPS), warning (new forecast models), communications (EMWIN Workshop and the CARIBE WAVE exercise) and education and preparedness efforts, including the TsunamiReady program. It also responded to inquiries from the region on different aspects of the tsunami warning system.

To strengthen and coordinate seismological research and earthquake risk reduction in the Middle America, the workshop “Geophysical Hazards and Plate Boundary Processes in Central America, Mexico, and the Caribbean: A Workshop to Build Seismological Collaboration and Capacity" was held 24-27 October, 2010 in Heredia, Costa Rica. This three-day workshop brought together seismologists and other geophysicists from Central America, Mexico, the Caribbean and the United States to plan and coordinate initiatives that will contribute to geophysical research and hazard mitigation in the region through international collaboration. Given the societal significance of the subject matter, in addition to participating scientists this workshop included the attendance of stakeholders from the public, private and development sectors. This workshop was funded by NSF and USAID, coordinated by IRIS and was supported by several institutions within Costa Rica. The tsunami risk and warning system were part of the discussions and the CTWP (lead on Preparedness and Response), USGS, PRSN and scientists and partners from US universities and other organizations are participating in the working groups established as a follow-up to the
Workshop. In February the leaders of the working groups met again to follow-up on actions, it was also proposed to call the initiative ALMA (Alliance for Middle America).

The second UNESCO-IOC-CARIBE EWS-GLOSS Caribbean Training Course for Operators of Sea Level Stations took place January 24-28, 2011 in St. George, Grenada. The first course had been held June, 2008 in Mayaguez, Puerto Rico. Twenty participants from 9 Member States in the Caribbean and Central America (Grenada, Barbados, St. Vincent and the Grenadines, St. Lucia, Puerto Rico, Haiti, Belize, Guatemala and Nicaragua) attended the training in Grenada. The course provided the sea level station operators in the region lectures and hands on training on the science and operations of sea level stations for tsunami and other coastal hazards warning purposes. The five lecturers from the University of Hawaii Sea Level Center, NWS Caribbean Tsunami Warning Program, Puerto Rico Seismic Network and the Caribbean Regional Association for Coastal Ocean Observations covered the following topics: Basic Oceanography, Oceanography of the Caribbean, Sea Level Variations, Sea Level Sensors, Real Time Data Transmissions, Data Processing and Analysis, Leveling, Best Practices and Deep Ocean Observations (DART).

In 2010 the National Science Foundation funded the Continuously Operating Caribbean GPS Observational Network (COCONet). This project will infuse and complement existing large-scale, state of the art geodetic and meteorological infrastructure in the Caribbean, forming the backbone for a broad range of Earth and atmospheric science investigations and enabling research on process-oriented science questions with direct relevance to geohazards. The observational infrastructure will serve as a regional platform for more focused topical geophysics studies by members of an international community of scientists. Related observations, instrumentation, and analyses, for example from other groups such as seismological community and those working on long-term or tsunami-related sea-level change, will complement the geodetic observations that come directly from COCONet. The infrastructure will also serve as a platform for international partnerships for science and societal applications. As part of this project, the plan is to install 50 GPS stations in the Caribbean and integrate 50 existing GPS stations. A meeting of US and Caribbean stakeholders and researchers was held February 3-4, 2011.

March 7-8, 2011 an IOCARIBE GOOS meeting was held in San Juan, Puerto Rico. After reviewing the coastal observation systems in the Caribbean it was decided that IOCARIBE GOOS should focus on coastal sea level and meteorological observations.

On March 23, 2011, 35 Caribbean nations and territories participated in the first Caribbean-wide Tsunami Communications Exercise (CARIBE WAVE/LANTEX 11). This event tested communications and tsunami response plans. The CTWP was the leader of the task team and both US TWCs participated in the design and conduct of the exercise. Five webinars were held with the Caribbean member states before the test to answer questions and explain the process of the communications test.

The CTWP has been tracking data availability from the CARIBE EWS seismic stations in real time for tsunami warning purposes and at IRIS for research applications. As of March, 74% (73/98) of the seismic stations of the CARIBE EWS implementation plan
are contributing in real time. 16% (16/98) are existing, but not contributing data to the system, for 8 stations funding needs to be identified, while 2 are in planning stages. There are an additional 26 stations from the Atlantic and 6 from the Pacific. This marks a significant improvement over last year with new data being contributed from Mexico, Colombia and the Cayman Islands. On IRIS a virtual seismic network was established to view the status of seismic data from Caribbean seismic stations being archived at the Data Management Center (http://www.iris.edu/gmap/ CARIBE-EWS). The PRSN also has a graphical tool where one can view data from seismic stations contributing to the warning component of the system (http://prsn.uprm.edu).

With IOCARIBE, the CTWP developed a Google Map interface to view the status of sea level stations in the Caribbean and Adjacent regions. It can be accessed thru the Caribbean Tsunami Warning Program website (http://www.srh.noaa.gov/srh/ctwp/). Currently the implementation plan includes 106 sea level stations. 7 correspond to DART buoys, while 99 are coastal sea level stations in the Caribbean. Of these 99 coastal stations, 31% (31) are contributing data within 6 minutes over GOES and FTP, 27 stations are existing, but either the data is not available or is transmitted with a time delay greater than 6 minutes, 28 stations are planned to be installed while funding needs to be identified for 9 stations to cover gap areas. There are 2 stations whose status is unknown, while 2 others are non operational, but not considered a priority. Over the past year, new stations were installed by the University of Hawai and the PRSN in Dominican Republic (2) and Curacao (1). By June 2011, additional stations in Haiti, Dominica, Grenada and Barbuda will have been installed or upgraded.

The US has also provided funding to upgrade an additional sea level station in Barbados and work with the CCCCC to design a sea level data repository at their facilities in Belize.

In April, 2011, a meeting was held with NOAA NESDIS to discuss the needs of high rate GOES slots for the CARIBE EWS. NOAA NESDIS, despite limited resources, has been able to accommodate all requests for GOES slots for stations of the CARIBE EWS. These efforts are also being coordinated with UNESCO/IOC/GLOSS.

Additional funding from Brazil and St. Vincent and the Grenadines has been provided to CARIBE EWS to also strengthen sea level observations in the Caribbean. This funding includes upgrades/new installations and a training course.

US is evaluating another proposal “Enhancing Multipurpose Sea Level Monitoring and Forecasting Capabilities in the Caribbean and Adjacent Regions” which was submitted by the CTWP. The purpose of this project is to improve sea level data availability, quality, management and usage in the Caribbean to enhance services of the Hydro Met offices and tsunami warning centers. As part of this project training, awareness and network building activities would be organized. Also on demand on site support will be provided to the operators and sea level data customers.

-One real-time sea-level gauge has been installed in eastern Guadeloupe (la Desirade island) in June 2010, one sea-level gage will be installed in north western Guadeloupe (close to the city of Deshaies) before the end of 2011. http://www.ioc-sealevelmonitoring.org/station.php?code=desi
Funds: CPER (Feder, European commission/Guadeloupe Regional Council/France government).

One broad-band station has been installed in eastern Guadeloupe (la Desirade island, DSD). 5 more broad band stations will be installed on the Guadeloupe archipelago (one in Saint Barthélémy).

The data from the 2 BB stations set up in Guadeloupe are freely distributed through the Geoscope data Center (seedlink protocol - geosbud.ipgp.fr -port TCP : 18000)

Within the framework of the CPER project, in the next 2 years, 4 BB stations will be installed in the Guadeloupe archipelago, 1 will be installed in Saint Barthélémy (close to Saint Marteen).

The 2 years TSUAREG InterReg project (European Commission) aiming at strengthening the seismological monitoring network and the sea-level monitoring network in the Lesser Antilles has been funded. It is a collaborative project between the Martinique and Guadeloupe observatories (FWI), the SHOM (French Navy), Météo-France (French Meteorological Service), the “Conseil Général de la Martinique” (Martinique General Council, CGMA) and the Seismological Research Center (The University of the West Indies, Trinidad and Tobago).

4 real time broad band stations will be installed in Martinique Island and 4 real time broad band stations will been installed in Cariacou, Northern Santa Lucia, Northern Dominica and Antigua in collaboration with SRC.

The 3 sea level gauges belonging to SHOM (Ile Royale, French Guiana, Fort de France, Martinique and Pointe a Pitre, Guadeloupe) will be upgraded and the transmission will be real time. The Martinique general council will upgrade its sea level gauge (le prêcheur) and install a new tide gauge on the eastern coast of Martinique.

Nicaragua will install 8 BB station in the north of country, this and next year, and the data transmission will be real time and shared with other institutions.

WG1 Chair participated in the workshop “Geophysical Hazards and Plate Boundary Processes in Central America, Mexico, and the Caribbean: A Workshop to Build Seismological Collaboration and Capacity" was held 24-27 October, 2010 in Heredia, Costa Rica.. In this opportunity the chair gave to know the advances in the Central America Region and the need of capacitating in different topics in Early Warning System.

WG1 Chair participated in the Follow-up Meeting to the Middle America Workshop in San Juan Puerto Rico, 3 – 4 February 2011
May 10-14, 2010 WG1 Chair participated in TSUNAMIREADY SUMMIT in Mayagüez, Puerto Rico. The Chair made a presentation given to know the experience about Tsunami Warning System installed in Nicaragua.

Also the Chair of WG1 participated as the ICG CARIBE EWS representative in the 6th TCP/JCOMM Workshop on Storm Surge and Wave Forecasting, Sto. Domingo, Dominican Republic, from 21 to 25 February 2011. The chair gave a presentation about WG1 activities.