

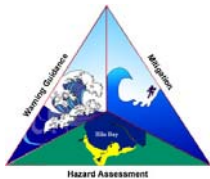


TsuInfo Alert

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National Tsunami Hazard Mitigation Program Multi-State Project: California and Hawaii Collaborate on Tsunami Response Playbooks

By Rick Wilson, California Geological Survey

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Through a National Tsunami Hazard Mitigation Program (NTHMP) supported, multi-state collaboration, the State of California is working with the State of Hawaii to implement an innovative tsunami evacuation and response tool developed by California for emergency managers in coastal communities.

The tsunami "Evacuation Playbook" approach provides detailed evacuation map scenarios and associated real-time response information for identified areas where flooding could occur due to tsunamis from earthquake sources around the Pacific.

For "less than worst case" distant-source tsunamis, having these secondary evacuation and response playbooks in place has proven useful by providing communities with more refined knowledge of evacuation requirements. These planning tools add value by incorporating factors important to a tsunami's coastal flood potential: Forecasted tsunami Amplitudes, Storm surge, and Tidal information, as well as the forecast Error and tsunami Run-up potential. These variables influence flooding, and when added together, are known as "FASTER," an automated approach developed by California and the National Weather Service.



These tools are being implemented by the State of California, which has similar coastal issues as Hawaii, including comparable tsunami hazard level and a large, vulnerable population. Representatives from California first presented the Playbook concept at the Hawaii Resilience Workshop in February, 2016, after which both states worked together to develop similar, draft Playbook products for the communities of Honolulu (above) and Hilo. In August 2016, these state partners held meetings with the Pacific Tsunami Warning Center, the counties of Hawaii and Honolulu, and the Hawaii Earthquake and Tsunami Advisory Committee to discuss potential use of the Playbook approach in Hawaii. State partners also collaborated with the U.S. Geological Survey, who presented the benefits of the Playbook approach as a potential method to reduce the number of people evacuated and to lower the cost of evacuation. One recommendation from the August meetings was that if Hawaii intends to utilize the Playbook approach, it should be done methodically and must be accompanied by a strong education and preparedness program.



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NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:

<http://d92019.eos-intl.net/D92019/OPAC/Index.aspx>



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Fifth Training Course for Operators of Sea Level Stations in the Caribbean and Adjacent Regions

Carolina Hincapié, NWS Caribbean Tsunami Warning Program

The Fifth Training Course for Operators of Sea Level Stations in the Caribbean and Adjacent Regions took place in Rodney Bay, Saint Lucia during the week of October 17th, 2016. It was organized by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, Commonwealth Marine Economies Programme (CME UK) of the National Oceanography Centre (NOC UK), and the Caribbean Tsunami Warning Program (US NOAA/NWS), within the framework of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS). Currently, 79 sea level stations in the Caribbean and Adjacent Regions are contributing to the CARIBE EWS and are available to the Tsunami Service Providers and US National Tsunami Warning Centers.

Thanks to Monaco's funding and the support of NOC UK, the course had participants from Anguilla (UK), Dominica, Honduras, Jamaica, Panama, St Vincent and the Grenadines, Turks and Caicos, and St Lucia. The main trainers were Prof. Phil Woodworth, Dr.

Francisco Calafat, and Dr. Angela Hibert from NOC. Also talks and technical experiences were shared by Mr. Jerard Jardin (University of Hawaii Sea Level Course), Carolina Hincapié (NOAA-CTWP), and Brandon Coleman (NOAA-NOS-COOPS).



The training course agenda covered a wide range of topics, including tide gauge technologies, practical levelling training, sea level variability (including tides and tsunamis), and an introduction to quality control/tidal analysis. For the first time, trainees received this type of course and each presented a written and oral report on the status of their sea level operations. The countries implementing Sea Level Stations are encouraged to meet the requirements of the Global Sea Level Observing System (GLOSS).

WORLD TSUNAMI AWARENESS DAY

Caribbean World Tsunami Awareness Commemoration Activity and Tsunami Ready Recognition of St. Kitts and Nevis

By Christa von Hillebrandt-Andrade, NOAA NWS Caribbean Tsunami Warning Program

In 2015 the United Nations General Assembly Resolution designated November 5 as World Tsunami Awareness Day. The first Caribbean World Tsunami Awareness Day event took place on October 20, 2016. The activity was organized by UNISDR in coordination with UNESCO IOC, Association of Caribbean States, the Government of Japan and the regional Caribbean and Central American Emergency Management Agencies, CDEMA and CEPREDENAC.



Session commemorating World Tsunami Awareness Day in the Caribbean.

According to the NOAA NCEI Global Tsunami Database, 75 tsunamis have killed 4484 people in the Caribbean over the past 500 years. During the Opening Ceremony, speakers highlighted the importance of being prepared for these infrequent but high impact events. Several references were made regarding the need of the Caribbean people to follow the example of a Japanese Rice farmer, who on November 5, 1854, alerted coastal villagers and lured them to safety by burning sheaves of rice on the hillside when he observed the telltale signs of a tsunami: ground shaking and the withdrawal of the sea. The Ambassador of Japan, who worked in disaster preparation in Sendai, one of the cities whose coastline was destroyed by the March 2011 Tsunami, said “I Never want to see that type of devastation again”.

As part of the activity, Claricia Langley-Stevens in representation of Saint Kitts and Nevis, received the UNESCO IOC Tsunami Ready Certificate of Recognition. The Federation is the first community to receive this recognition as part of the CARIBE EWS Tsunami Ready pilot project, which is modeled after the successful US TsunamiReady program and an earlier IOC-NOAA Tsunami Ready pilot project. St. Kitts and Nevis join 51 other coastal communities that have been recognized as TsunamiReady in Puerto Rico, USVI, BVI and Anguilla. The St. Kitts and Nevis Pilot was coordinated by the US Caribbean Tsunami Warning Program, with funding from UNDP and USAID/OFDA. Several other Member States also indicated their interest in implementing the Tsunami Ready program in their vulnerable communities.



The Chair of UNESCO IOC CARIBE EWS, Christa von Hillebrandt presenting the Tsunami Ready Certificate of Recognition of St. Kitts and Nevis to Claricia Langley-Stevens, Deputy National Disaster Coordinator at NEMA.

WORLD TSUNAMI AWARENESS DAY

Tsunami Dead Remembered

By Denis McClean, United Nations Office for Disaster Risk Reduction (UNISDR)

NEW DELHI, 5 November 2016 - The UN Secretary-General's Special Representative for Disaster Risk Reduction, Mr. Robert Glasser, initiated a minute's silence today in remembrance of all those who have lost their lives in tsunamis as the first World Tsunami Awareness Day was commemorated on the final day of the Asian Ministerial Conference for Disaster Risk Reduction.

The theme of the tsunami day is "Live to Tell", creating a link back to the 13 October International Day for Disaster Reduction which focussed on reducing disaster mortality, and the focus is on promoting effective education and evacuation drills.

Mr. Glasser began a panel discussion by recalling that the day was chosen to honour the efforts of a Japanese local leader, Goryo Hamaguchi, who set fire to his rice sheaves to warn people that a tsunami was coming following an earthquake on 5 November 1854.

"In total, 16 major tsunamis killed 250,900 people in 21 countries between 1996 and 2015. Tsunamis know no borders, making international cooperation key for deeper political and public understanding of risk reduction measures," he said.

See full article: <http://www.unisdr.org/archive/50908>



Mr. Robert Glasser, UNISDR Chief, (left) led a moment's silence today at the World Tsunami Awareness Day Commemoration on the final day of the Asian Ministerial Conference on Disaster Risk Reduction.

Challenge of Tsunami Awareness

By Denis McClean, United Nations Office for Disaster Risk Reduction (UNISDR)

NEW DELHI, 3 November 2016 - If proper coastal security measures had been in place at the time of the Great East Japan Earthquake and Tsunami in March 2011, many lives could have been saved, according to the Japanese MP, Mr. Toshihiro Nikai, who is also the Secretary-General of the governing Liberal Democratic Party.



(Left to right) Tsunami Session speakers: Mr. Tony Elliott, Dr. Satheesh Shenoi, Mr. Toshihiro Nikai, Ms. Regina Prosper, Prof. Fumihiko Imamura, Mr. Pallava Bagla, Ms. Kirsi Madi, Dr. Laura Kong.

Mr. Nikai, a leading advocate for World Tsunami Awareness Day, was speaking at a Special Session on the eve of the opening today of the Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR2016). He said that the loss of almost 20,000 lives in the 2011 Tohoku disaster was the biggest regret of his political life.

Mr. Nikai said that the main job of any politician is to ensure people's safety and to protect their assets. Explaining his passionate support for World Tsunami Awareness Day which will be commemorated for the first time on Saturday, November 5, Mr. Nikai said: "It is our duty to make sure that all this knowledge and experience of tsunamis is shared throughout society. Even if one more child knows that you should immediately flee to a high point the effort would be worth it."

Education and awareness was a major theme of the Tsunami Special Session. Prof. Fumihiko Imamura, Director, International Research Institute of Disaster Science, Tohoku University, highlighted two different experience of two schools in Japan. One where many children died because of uncertainty about how to respond to the warnings and another where they were saved because they took the initiative to flee.

See full article: <http://www.unisdr.org/archive/50872>

WORLD TSUNAMI AWARENESS DAY

Dr. Eddie Bernard, Awarded the 2016 Hamaguchi Award For Enhancement of Tsunami/Coastal Disaster Resilience

By Stephanie Earls, TsuInfo Alert Editor

Dr. Eddie Bernard, former Director of NOAA's Pacific Marine Environmental Laboratory, was one of three recipients of the inaugural 2016 Hamaguchi Award for Enhancement of Tsunami/Coastal Disaster Resilience, as part of the commemoration of World Tsunami Awareness Day. This award is presented to individuals and/or organizations that have made significant scientific or pragmatic contributions to the enhancement of coastal resilience against tsunami, storm surge, and other coastal disasters.



The Japanese Minister of Land, Infrastructure, Transport and Tourism, Mr. Ishii, presenting the award to Dr. Eddie Bernard.

The award is named after Mr. Goryo Hamaguchi, who guided fellow villagers to safety when a tsunami hit the Japanese Kii Peninsula in 1854 by setting fire to rice harvests along the evacuation route.

Following the award ceremony that took place on October 31, 2016, Dr. Bernard gave a 30 minute presentation to the 250 assembled guests titled "Tsunami Preparedness: Is Zero Casualties Possible?" inspired by his 2015 visit to the community of Kuroshio-cho, where they have the goal of zero deaths from the next tsunami.

2016 Award Ceremony & Commemorative Lecture of Hamaguchi Award
For Enhancement of Tsunami/Coastal Disaster Resilience

Commemorating World Tsunami Awareness Day of November 5, we have inaugurated the "Hamaguchi Award" for individuals and/or organizations that have made significant scientific or pragmatic contributions to the enhancement of coastal resilience against tsunami, storm surge and other coastal disasters, which will raise people's awareness of disaster resilience. The award is named after Mr. Hamaguchi Goryo who protected and saved a village from a tsunami about 150 years ago.

The award ceremony and commemorative lectures by awardees are scheduled as follows:

Date	October 31, 2016 (Monday)
Venue	The Tokai University ChubuKoru-Kaikou (Tsurunan, Kasugasaki Bldg.307)
Program	15:00 Award Ceremony 15:40 Commemorative Lectures 17:45 Reception Party

Supporting Organizations

- Ministry of Land, Infrastructure, Transport and Tourism, Japan (MLIT)
- Director General for Disaster Management, Culture Office
- Wakayama Prefecture
- Hankyu Railway
- Institute of Global Safety Science
- Coastal Engineering Committee, Japan
- Society of Civil Engineers (SCE)
- Architectural Institute of Japan (AIJ)
- Japan Society for Disaster Information Studies
- Japan Society for Natural Disaster Science
- National Research Institute for Earth Science and Disaster Resilience (NIED)

Selection Committee on the Hamaguchi Award

Prof. Yoshio Kawata¹⁾ Professor Emeritus, Kyoto University, Director and Professor, Research Center for Safety Science at Kansai University and Executive Director of Disaster Reduction and Human Resilience Institute, Japan
Dr. Kazuki Fujita Director General, National Institute for Land and Infrastructure Management (NILIM)
Dr. Yuzo Kanagi Former Deputy Director General, NILIM
Dr. Takao Uemoto President, Public Works Research Institute (PWRI)
Dr. Yoshiki Koyama²⁾ Director General, Port and Airport Research Institute (PARI)
Dr. Giovanni Corotis Research Director, Maritime and Coastal, IIR, Wallingford, United Kingdom
Prof. Billy Edge Professor, North Carolina State University
Dr. Jan J. van de Ven Scientific and Professional, Coastal and Hydraulic Laboratory, Expert Research & Development Centre, U.S. Army Corps of Engineers
Mr. Deshak Varma Senior Advisor on Coastal Flooding, Delft, Netherlands

¹⁾ Chairperson, ²⁾ Secretariat

Organized by

International Promotion Committee for Tsunami-Resilient Disaster Resilience Technology

- Port and Airport Research Institute (PARI), National Institute of Maritime, Port and Aviation Technology (NIMPT)
- Public Works Research Institute (PWRI)
- Ports and Harbors Association of Japan (PHA)
- The Overseas Coastal Area Development Society of Japan (OCADS)
- Coastal Development Institute of Technology (CDIT)
- International Visualization and Environment Research Foundation (IVARE)
- Service Centre of Port Engineering (SCOPE)

Dr. Eddie Bernard Bio: Dr. Eddie Bernard, who served as the founding chair of the U.S. National Tsunami Hazard Mitigation Program, made significant contributions to the development of the tsunami detection and flooding forecast system in use in the United States and along the Pacific Rim. These flooding forecasts are based on real-time data



obtained by DART buoys, which accurately measure tsunamis in the deep sea and transmit these data through satellites to tsunami warning centers. Deep sea tsunami data are then assimilated into numerical models that forecast flooding before tsunami arrival. After the 2004 Indian Ocean tsunami, the system was expanded to the Indian Ocean and the Caribbean Sea and became the worldwide standard of the tsunami warning system. He was awarded a Service to America Medal (2008) and the Department of Commerce Gold Medal (2005) for his work in establishing an international tsunami detection and forecast system and a U.S. tsunami mitigation program.

WORLD TSUNAMI AWARENESS DAY

At Tsunami Summit, High School Students Commit to Curb Risk

By Yuki Matsuoka, United Nations Office for Disaster Risk Reduction - Hyogo Liaison Office (UNISDR Hyogo)

KUROSHIO, Japan, 1 December 2016 – Hundreds of high school students from around the world have pledged to step up efforts to reduce disaster risk, at a global gathering held to mark the first edition of World Tsunami Awareness Day.

The 25-26 November High School Students Summit in the southern Japanese town of Kuroshio brought together 360 young people from 30 countries to share lessons about the role they can play in curbing risk.

They wrapped up their summit by issuing the Kuroshio Declaration, in which they vowed to spread the word in their communities about tsunami threats and how to tackle them, and were formally designated as “Youth Ambassadors for Tsunami Awareness”.

“Being aware and prepared is key to survival. I count on you to be leaders who can reduce the risk of future disasters,” said UN Secretary-General Ban Ki-moon in a message to participants.

The UN leader’s remarks were underscored by Mr. Shinzo Abe, Prime Minister of Japan.

“I hope all of you will play an active role as future leaders towards disaster risk reduction from a global perspective. It will eventually lead to a wave of saving the precious lives of many people for generations to come,” he said in a video address to the students.

Tsunamis, which are sparked by undersea earthquakes, are rare. But they can be extremely deadly, as epitomised by the Indian Ocean Tsunami 2004, which claimed more than 227,000 lives. That disaster spurred a global drive to create early warning systems and rein in risk.

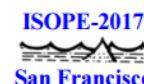
Japan, whose language gave the world the word tsunami, is a frontline state. Its biggest disaster in decades was in 2011, when the Great East Japan Earthquake and Disaster underscored the nature of multi-hazard risk after the wave took out the Fukushima nuclear power plant, with enduring consequences.



See full article: <http://www.unisdr.org/archive/51166>

UPCOMING NTHMP & RELATED EVENTS

- ◆ January 30-February 3, 2017—2017 NTHMP Annual Meeting (Portland, Oregon)
<http://nws.weather.gov/nthmp/2017annualmeeting/>
- ◆ April 18-20, 2017—2017 Seismological Society of America Annual Meeting (Denver, Colorado)
<http://meetings.seismosoc.org/>
- ◆ June 25-30, 2017—6th Tsunami and Safety Symposium ISOPE 2017 (San Francisco, California)
<http://www.isopec.org/>

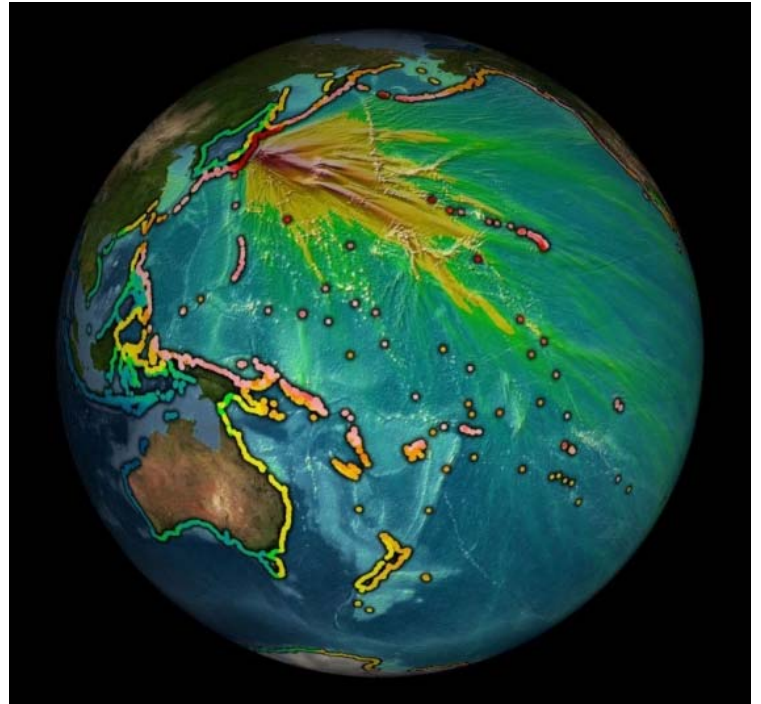


NOAA Science On a Sphere Visualizations Show Tsunami Impacts Around the Globe

By NOAA's Office for Coastal Management

November 4, 2016 — In the past dozen years, there have been six major tsunamis around the world which resulted in nearly a quarter million deaths and over \$260 billion in property damage. Each of these tsunamis focused global attention on the threat and significant impacts of these catastrophic events. In the United States, the potential for tsunamis is most prevalent in the Hawaii and the surrounding Ring of Fire. In fact, more people have died in Hawai'i from tsunamis than from hurricanes, floods, and volcanoes combined, making it the state's deadliest natural hazard.

Tsunami education plays a critical role when taking steps towards increasing the resilience of coastal communities around the world. Coastal communities need to understand the hazards tsunamis pose not only to know what to do when a tsunami warning is issued, but in the worst cases they need to know what to do before any tsunami warning can be given when the tsunami forms from a nearby earthquake. However, tsunami science is complex and difficult to visualize, as the effects of these phenomena are multifaceted and yield far reaching consequences. NOAA's Science On a Sphere® (SOS) is a powerful visualization tool and an ideal medium for showcasing the truly global impact of tsunamis. To adapt this tool for tsunami education, NOAA's Pacific Tsunami Warning Center and Office for Coastal Management in Hawaii have developed intuitive visualizations that show viewers the impact of a tsunami in an easy way to understand.



The Pacific Tsunami Warning Center and Office for Coastal Management are creating a suite of historical and real-time tsunami animations. In the past, visualizations did not necessarily show coastal impacts and each one used a different color scheme, making it difficult to compare the severity of different tsunamis. This new series of animations also show what happens when tsunami waves strike land, the same information that Pacific Tsunami Warning Center uses to issue tsunami hazard guidance for impacted coastlines. In addition, the wave height color scheme is based on Pacific Tsunami Warning Center's warning criteria and is consistently applied across all of these animations thus allowing for easy comparisons between tsunamis. This set of animations also serves as a ready-made template that NOAA scientists can use to visualize new tsunamis — faster, easier, and more intuitively.

See full article: <http://www.noaa.gov/stories/noaa-science-on-sphere-visualizations-show-tsunami-impacts-around-globe>

TSUNAMI RESEARCH

CURRENT RESEARCH

Bechle, A. J.; Wu, C. H.; Kristovich, D. A. R.; Anderson, E. J.; Schwab, D. J.; Rabinovich, A. B., 2016, Meteotsunamis in the Laurentian Great Lakes: Nature, Scientific Reports 6, Article 37832, DOI: 10.1038/srep37832.

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A Global Assessment of Tsunami Hazards Over the Last 400 Years

By Fumihiko Imamura, Anawat Suppasri, Panon Latcharote, Takuro Otake
International Research Institute of Disaster Science (IRIDeS), Tohoku University

EXECUTIVE SUMMARY: This report is our contribution towards World Tsunami Awareness Day, which was proposed by the United Nations (UN) in 2015. We conducted a global tsunami hazard assessment for local regions, including low tsunami risk areas, based on a 400-year database which allows insight on potential future tsunamis based on the seismic gap.

The resulting tsunami hazard could be displayed on a global map and enable us to easily observe the local effects of tsunamis. Two criteria were selected to represent the past 100 major earthquake generated tsunamis: first, the earthquakes must be larger than magnitude 7.5 and secondly, occurred after the year 1600. Based on the results of the simulation, the locations of modern tsunamis (from the periods of 1970 to 2016) greater than 2 meters in height, are limited to areas affected by the 2004 Indian Ocean Tsunami, and the 2011 Great East Japan Tsunami.

Regardless, damaging tsunamis have been witnessed everywhere in the world, especially along the Pacific Rim. This observation shows the importance of assessing or knowing the hazards based on historical events beyond our memory. Comparisons between tsunami height and wave force show that only using the tsunami height might underestimate the building damage. We wish that as a part of the World Tsunami Awareness Day related activities, our results and findings will increase tsunami awareness at the global scale, especially in comparatively low tsunami risk areas, and reduce human loss from future tsunamis.



See full report: http://irides.tohoku.ac.jp/media/files/archive/global_assessment_tsunami_hazards_400yrs.pdf