TsuInfo Alert

prepared by the Washington State Department of Natural Resources on behalf of the
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NTHMP Educates about Meteotsunamis

By Christa Rabenold, Mitigation Specialist
NOAA/National Weather Service Tsunami Program

The Mitigation and Education Subcommittee of the National Tsunami Hazard Mitigation Program (NTHMP) has produced a fact sheet about meteotsunamis to better inform emergency managers and the public about the phenomena and how meteotsunamis could impact U.S. coasts.

Meteotsunamis have characteristics similar to earthquake-generated tsunamis, but they are caused by air pressure disturbances often associated with fast moving weather systems, such as squall lines.

Weather system that generated a meteotsunami in June 2013. Credit: Buddy Denham

Interest in, and knowledge about, meteotsunamis in the United States has increased in recent years in the wake of confirmed meteotsunamis off the coasts of New Jersey, Massachusetts, and Maine. Research shows that meteotsunamis are more common than previously thought and suggests that some past events may have been mistaken for other types of coastal floods, such as storm surges or wind-driven seiches. Although most meteotsunamis are too small to notice, large meteotsunamis can have devastating coastal impacts, but not to the extreme level of the 2004 Indian Ocean and 2011 Japan tsunamis.

The new fact sheet describes meteotsunamis and NOAA's efforts to develop a meteotsunami forecast and warning system. These efforts, which are still in the early stages, include developing a process that outlines when, where, and how the National Weather Service should issue meteotsunami warnings based on high-resolution air pressure measurements combined with meteotsunami forecast models.

The NTHMP recognizes the risk that meteotsunamis pose and supports NOAA's work in this regard. In the meantime, emergency managers and the public should heed warnings issued by local National Weather Service Weather Forecast Offices, which can identify a potential coastal threat based on weather conditions. The NTHMP also encourages program partners to raise public awareness about meteotsunamis. This new fact sheet, which is available at http://nws.weather.gov/nthmp/meteotsunamis.html, can help them do just that.

In this issue:

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands
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David K. Norman - State Geologist

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NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:
http://d92019.eos-intl.net/D92019/OPAC/Index.aspx

HI-EMA to Receive Nearly $500K in Tsunami Funding

By Big Island Now staff

The State of Hawai'i will receive nearly half a million dollars in grant funding to provide support to the Hawai'i Emergency Management Agency's mission to keep the public informed and prepared for tsunamis.

United States Senator Brian Schatz, a member of the Senate Appropriations Committee, made the announcement of the funds Friday.

"In Hawai'i, being well-prepared for natural disasters like tsunamis can mean the difference between life and death," said Senator Schatz. "This critical funding will help improve our tsunami disaster planning so we can better protect Hawai'i's coastal communities and save lives."

The National Tsunami Hazard Mitigation Program has faced attempts at defunding in Congress, according to officials in Senator Schatz office. However, as a member of the Senate Appropriations Committee, he has put effort into restoring the funding in the Commerce, Justice, and Science appropriations bill.

See full article: http://bigislandnow.com/2015/08/21/hi-ema-to-receive-nearly-500k-in-tsunami-funding/

Caribbean and Adjacent Regions Finalizing Implementation of Pacific Tsunami Warning Center (PTWC) Enhanced Tsunami Products

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

At the Tenth Session of the UNESCO Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS-X) held in Philipsburg, Sint Maarten, from 19 to 21 May 2015, the Pacific Tsunami Warning Center Enhanced Tsunami Products were endorsed and approved to be fully implemented with a target date of March 1, 2016.

This process began in 2012 at the Seventh Session of ICG/CARIBE-EWS-VII with several meetings, recommendations, and evaluations. As result, PTWC will be issuing the current tsunami products in parallel with enhanced products starting on October 26, 2015 to make a smooth transition without affecting the services provided to the region. These enhanced products, which form part of the international tsunami services, will be distributed only via email to the designated CARIBE EWS Tsunami Warning Focal Points (TWFPs) and National Tsunami Warning Centers (NTWCs).

The PTWC Enhanced Products include forecasts and graphical formats and establish four levels of tsunami wave amplitude threat to assist NTWCs and/or TWFPs in assessing their national threat for subsequent issuance of national tsunami warnings/alerts to their populations. The enhanced products will provide general guidance on impact, and are expected to greatly reduce the number of areas warned unnecessarily, while still remaining conservative to protect lives. These products have been issued for international stakeholders within the framework of the UNESCO Pacific Tsunami Warning System since October 1, 2014.

In developing its new enhanced products, PTWC incorporated feedback from previous CARIBE-WAVE exercises: CARIBE-WAVE 13 (20 March 2013) CARIBE-WAVE 14 (26 March 2014) and 15 (25 March 2015); and from a number of CARIBE-EWS meetings and CTIC/ITIC/CTWP/IOC tsunami trainings in 2014 and 2015.

The Caribe Wave 16 will be conducted on 17 March 2016 and will be based solely on the PTWC enhanced products. The exercise will help member states of the ICG/CARIBE EWS test their capabilities in responding to an emergency based on their own protocols with input from PTWC in regards to these enhanced products.

The domestic products issued by the NOAA TWC are not affected by this change in International Services.

IN THE NEWS

UW Researchers Model Tsunami Hazards on the Northwest Coast

By James Urton, University of Washington News and Information

Recent press and social media coverage have reminded residents of the Pacific Northwest that they live in a seismically active region. Stretching offshore from northern California to British Columbia, the Cascadia subduction zone could slip at any time, causing a powerful earthquake and triggering a tsunami that would impact communities along the coast.

Scientists from multiple disciplines at the University of Washington and other institutions are learning more about this hazard. Dozens of UW scientists are part of the M9 Project, a research endeavor funded by the National Science Foundation to study the Cascadia subduction zone and communicate information about potential hazards to government officials and the public. Key goals of the M9 Project include mathematical modeling of tsunami waves, which tries to predict where and how an earthquake-triggered wave will affect the coast.

Two University of Washington scientists—applied mathematics professor Randy LeVeque and affiliate professor of Earth and space sciences Frank Gonzalez—recently talked about how they model tsunami hazards along the Northwest coast.

Access full article: http://www.washington.edu/news/2015/08/17/uw-researchers-model-tsunami-hazards-on-the-northwest-coast/

Managing the Risks of Tsunami in New Zealand – Summary of Key Measures

By New Zealand Ministry of Civil Defence & Emergency Management

The Earthquake Commission has commissioned research that looks at the tsunami risks facing New Zealand.

The Ministry of Civil Defence & Emergency Management coordinates the Tsunami Risk Management Programme, which considers a comprehensive range of risk reduction measures, and is overseen by a collaborative working group involving local and central government, science agencies, and private sector organisations.

The programme has either considered previously, or is working on the options contained in the EQC research. The research will be fed into the programme's ongoing work programme.

Summary of measures to reduce tsunami risks to New Zealand. The following activities or projects are being worked on:

- Evacuation modelling and mapping
- Inundation mapping
- CDEM Group support and guidance
- Building and infrastructure
- Vertical evaluation
- Land-use planning
- Social science research and reviews
- Support of local/regional tsunami mitigation groups
- Education, communication and exercises

Access full article: http://www.civildefence.govt.nz/about/news-and-events/news/managing-the-risks-of-tsunami-in-new-zealand-summary-of-key-measures/

RESEARCH

Tsunamis: bridging science, engineering and society

Compiled and edited by Utku Kanoglu, Vasily Titov, Eddie Bernard and Costas Synolakis

Theme issue: Philosophical Transactions A, v. 373, no. 2053

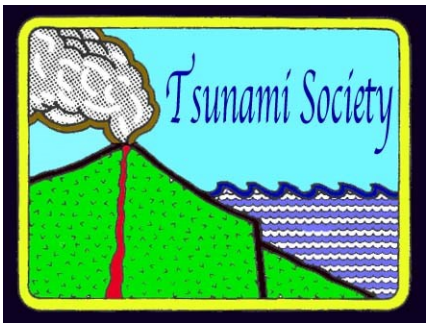
- **Tsunamis: bridging science, engineering and society** Authors: U Kânoğlu, V Titov, E Bernard and C Synolakis
- **The quest for wisdom: lessons from 17 tsunamis, 2004–2014** Author: EA Okal
- **Evolution of tsunami warning systems and products** Authors: E Bernard and V Titov
- **Response to the 2011 Great East Japan Earthquake and Tsunami disaster** Authors: S Koshimura and N Shuto
- **Resilience from coastal protection** Authors: LC Ewing
- **New computational methods in tsunami science** Authors: J Behrens and F Dias
- **Tsunami currents in ports** Authors: JC Borrero, PJ Lynett and N Kalligeris
- **On the characteristics of landslide tsunamis** Authors: F Løvholt, G Pedersen, CB Harbitz, S Glimsdal and J Kim
- **Are meteotsunamis an underrated hazard?** Authors: CB Pattiaratchi and EMS Wijeratne
- **The meteorite impact-induced tsunami hazard** Authors: K Wünnemann and R Weiss
- **Source mechanisms of volcanic tsunamis** Author: R Paris
- **Geological and historical evidence of irregular recurrent earthquakes in Japan** Author: K Satake
- **Palaeotsunamis and tsunami hazards in the Eastern Mediterranean** Authors: P England, A Howell, J Jackson and C Synolakis
- **The Fukushima accident was preventable** Authors: C Synolakis and U Kânoğlu

Access full articles: http://rsta.royalsocietypublishing.org/content/373/2053.toc

Science of Tsunami Hazards, v. 34, no. 4

Journal of Tsunami Society International

- **The Inexpensive Device for Sea Level Measurements**
  Author: A. Annunziato
- **Comparative Numerical Simulation of Tohoku 2011 Tsunami**
  Authors: N.A. Baranova, A.A. Kurkin, R.Kh. Mazova, G. Pararas-Carayannis
- **Field Survey Report of Tsunami Effects Caused by the August 2012 Offshore El Salvador Earthquake** Author: Francisco Gavidia-Medina



Access full articles: http://www.tsunamisociety.org/STHVol34N4Y2015.pdf

RESEARCH

Simulation of Tsunami Generation, Propagation and Coastal Inundation in the Eastern Mediterranean

By: A. G. Samaras, Th. V. Karambas, and R. Archetti
From: Ocean Science, v. 11, no. 4, p. 643-655.

Abstract: In the present work, an advanced tsunami generation, propagation and coastal inundation 2-DH model (i.e. 2-D Horizontal model) based on the higher-order Boussinesq equations – developed by the authors – is applied to simulate representative earthquake-induced tsunami scenarios in the Eastern Mediterranean. Two areas of interest were selected after evaluating tsunamigenic zones and possible sources in the region: one at the southwest of the island of Crete in Greece and one at the east of the island of Sicily in Italy. Model results are presented in the form of extreme water elevation maps, sequences of snapshots of water elevation during the propagation of the tsunamis, and inundation maps of the studied low-lying coastal areas. This work marks one of the first successful applications of a fully nonlinear model for the 2-DH simulation of tsunami-induced coastal inundation; acquired results are indicative of the model's capabilities, as well of how areas in the Eastern Mediterranean would be affected by eventual larger events.

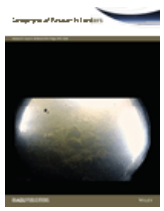
Access full article: http://www.ocean-sci.net/11/643/2015/os-11-643-2015.html

Dynamic Models of an Earthquake and Tsunami Offshore Ventura, California

By Kenny J. Ryan, Eric L. Geist, Michael Barall, David D. Oglesby

From: Geophysical Research Letters, v. 42, no. 16, p. 6599-6606.

Abstract: The Ventura basin in Southern California includes coastal dip-slip faults that can likely produce earthquakes of magnitude 7 or greater and significant local tsunamis. We construct a 3-D dynamic rupture model of an earthquake on the Pitas Point and Lower Red Mountain faults to model low-frequency ground motion and the resulting tsunami, with a goal of elucidating the seismic and tsunami hazard in this area. Our model results in an average stress drop of 6 MPa, an average fault slip of 7.4 m, and a moment magnitude of 7.7, consistent with regional paleoseismic data. Our corresponding tsunami model uses final seafloor displacement from the rupture model as initial conditions to compute local propagation and inundation, resulting in large peak tsunami amplitudes northward and eastward due to site and path effects. Modeled inundation in the Ventura area is significantly greater than that indicated by state of California's current reference inundation line.



Access full article: http://onlinelibrary.wiley.com/doi/10.1002/2015GL064507/abstract