

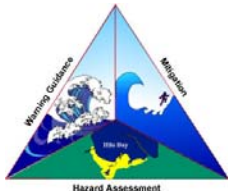


TsuInfo Alert

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National Tsunami Hazard Mitigation Program

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FEBRUARY 2017

Volume 19, Number 1

National Tsunami Hazard Mitigation Program Annual Meeting Recap

By Dr. Rocky Lopes, NTHMP Administrator

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84 of the nation's tsunami, geological, earthquake, and coastal hazard experts convened in Portland, Oregon, January 30 - February 3, 2017. Eight concurrent and sequential meetings were held.

SUBCOMMITTEE MEETINGS (JANUARY 30, 2017): The NTHMP Mapping and Modeling Subcommittee (MMS) met for a lengthy day. Led by Co-Chairs Dr. Dmitry Nicolsky (University of Alaska/Fairbanks) and Marie Eble (NOAA Pacific Marine Environmental Lab), the members discussed: MMS-related outcomes from the current NTHMP Strategic Plan; the FEMA HAZUS model; Post-tsunami protocols; model benchmarking; guidelines for NTHMP inundation maps; inundation zones for certain communities; MMS Landslide Modeling Workshop; and more modeling activities. Meeting notes and presentations are available.



NTHMP 2017 Annual Meeting attendees

The NTHMP Mitigation and Education Subcommittee (MES) meeting was led by Co-Chairs Gala Gulascik, Dr. Laura Kong, and Kevin Miller. Besides conducting routine subcommittee business, presentations were given on Wayfinding Techniques and Technology by Dr. Althea Rizzo and EERI School Earthquake Safety Initiatives by Ian Robertson (remotely). Strategic planning and other discussions rounded out the meeting's conversations.

The NTHMP Warning Coordination Subcommittee (WCS) was led by Co-Chairs Dr. Chip McCreery, Dr. Althea Rizzo, and Paul Whitmore. An ambitious presentation of updates on WCS action items, activities, stakeholder input, events of 2016, TWC products, and the new tsunami.gov website were discussed.

SUBCOMMITTEE COLLABORATION MEETING (JANUARY 31, 2017): A six-hour meeting of the MES and MMS was facilitated by Dr. Rocky Lopes. Discussions on what

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Division of Geology and Earth Resources
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<http://www.dnr.wa.gov/researchscience/topics/geologypublicationslibrary/pages/tsuinfo.aspx>

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NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:

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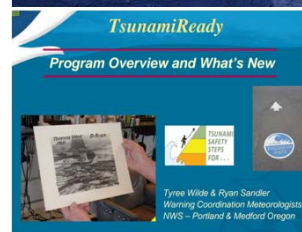
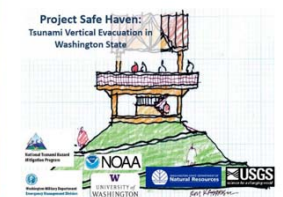
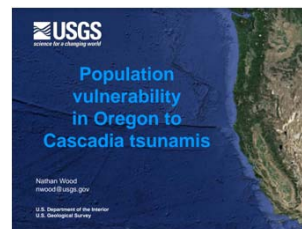
The views expressed herein are those of the authors and not necessarily those of NOAA, the Washington Department of Natural Resources, or other sponsors of TsuInfo Alert.

Oregon Holds First Tsunami Conference

By Althea Rizzo, Oregon Emergency Management

On December 7 & 8, 2016, over 120 people attended the first Oregon Tsunami Conference hosted by the Oregon Office of Emergency Management (OEM) in Florence, Oregon. Over 25 speakers gathered to share the latest scientific understanding of the Cascadia Subduction Zone as well as best practices from a wide range of fields. The day and half long event had a wide range of professionals in attendance from scientists, engineers, planners, volunteers, and first responders.

The stated purpose of the conference was to bring together a significant portion of those working to prepare Oregon for tsunami. Attendees seemed to appreciate the opportunity to meet others and network and learn from their peers. The conference was funded by the National Tsunami Hazard Mitigation Program and the Florence Event Center donated the conference venue. OEM is planning another larger conference in 2018.



Many of the presentations are online and can be accessed at this link:
<https://drive.google.com/open?id=0B93BpYE6qgDbV19Kc0V6UIFzZGg>

NTHMP ANNUAL MEETING

National Tsunami Hazard Mitigation Program Annual Meeting Recap

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each subcommittee needs and can do for the other led to some action items that each subcommittee will follow up on. Further discussion and integration of the NTHMP Strategic Plan outcomes indicated completed work and ongoing activities to bring forward into the next NTHMP Strategic Plan. Dr. Nate Wood of the U.S. Geological Survey explained the current and potential future work related to pedestrian evacuation modeling which is important to life-safety within tsunami inundation zones.

NTHMP ISLAND CAUCUS (JANUARY 31, 2017): The NTHMP Coordinating Committee approved creation of an "Island Caucus" that brings together people who live and work on islands to discuss tsunami issues unique to island situations. This is a great way to foster cooperation and sharing among people who serve vulnerable U.S. islands in states and territories. Kevin Richards facilitated conversations about how this caucus should be governed, as well as topics of mutual interest during this two-hour meeting.

NTHMP ANNUAL MEETING (FEBRUARY 1, 2017): The NTHMP Annual Meeting was attended by some 84 people at peak, the largest crowd ever. Representatives from all over the United States and Canada attended. The meeting began with NTHMP Chair, Dr. Grant Cooper (NWS Western Region Director) recognizing two long-serving individuals for their contributions: Dr. Vasily Titov of the NOAA Pacific Marine Environmental Lab was thanked for 16 years of service to the NTHMP. Testimonials by the audience affirmed deep appreciation and respect for Dr. Titov.

With a heavy heart, the NTHMP bade farewell and recognized Tim Walsh of the State of Washington Department of Natural Resources for 23 years of service to the NTHMP. He has been the longest-serving member of the NTHMP's Coordinating Committee. Tim will continue to work for WA-DNR, but is stepping back on his extra-curricular work a bit as he approaches retirement. There were a large number of accolades from meeting attendees for Tim's contributions to the NTHMP, his knowledge, history, and collegial support. He will be greatly missed!



Tim Walsh recognized for 23 years of service

Ms. Allison Allen, Branch Chief, National Weather Service Marine, Tropical, and Tsunami Services Branch, described the reorganization of the National Weather Service and where the Tsunami Program now resides in the NWS structure.

Mike Angove, NWS Tsunami Program Lead, provided an update on the Tsunami Program, its research activities, international activities, and new initiatives. This presentation provided an interesting opportunity for dialogue with NTHMP partners. Mike followed with a presentation about non-seismic sources of tsunamis, giving insights into related research.

NTHMP subcommittee Co-Chairs updated meeting attendees on their respective subcommittees' activities and plans for 2017. Dr. Dmitry Nicolsky of Alaska was re-elected to serve another two-year term as the state Mapping and Modeling Subcommittee Co-Chair. Dr. Althea Rizzo was re-elected to serve another two-year term as the state Warning Coordination Subcommittee Co-Chair. Ms. Christa von Hillebrandt-Andrade was elected to serve a two-year

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NTHMP ANNUAL MEETING

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term as the NOAA Mitigation and Education Subcommittee Co-Chair, while Kevin Miller of California was re-elected to another two-year term as the state MES Co-Chair. Dr. Laura Kong was thanked and recognized for six years of service as the NOAA Co-Chair for the MES.

Dr. Rocky Lopes followed with an update on the TsunamiReady Program. He praised NTHMP colleagues for their ongoing support and reported that every new TsunamiReady Community and renewed communities since June, 2016, used the updated TsunamiReady Guidelines to which the NTHMP contributed its expertise. Currently, there are 197 TsunamiReady sites throughout the nation. All U.S. Island territories are now recognized as TsunamiReady. The next growth area for the TsunamiReady Program is for TsunamiReady Supporters. The Supporter Program was launched in August, 2016, and is already taking off.



Rick Wilson, NTHMP Science representative from California, provided an update about the evolution of maritime safe-depth recommendations and the differences in different locations of U.S. shorelines. Guidance is still in development as a joint effort by the Mapping and Modeling Subcommittee and the Mitigation and Education Subcommittee.

Dr. Nate Wood of the U.S. Geological Survey, along with colleagues Jeff Peters and Kevin Henry, provided an update on their work on pedestrian evacuation modeling research. There are numerous opportunities to apply this work in states and territories with critically difficult-to-evacuate geographic areas (spits, peninsulas, low-lying areas with single exit points, etc.)

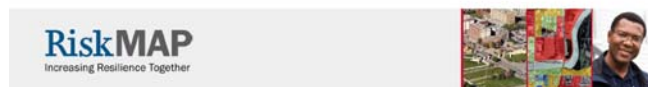


National Tsunami Hazard Mitigation Program (NTHMP)
February 1, 2017

Doug Bausch, PDC, NiyamIT

Stephanie Ross of the USGS gave an update following the successful NTHMP/USGS workshop last year. Strong interest in ongoing collaboration with the USGS remains, especially when investigating tsunami sources that inform modeling and mapping projects by NTHMP partners.

Doug Bausch of the Pacific Disaster Center and contractor for development of the tsunami module for FEMA's HAZUS program explained that this program is completing final testing and will be launched this spring. It has been a long time in development, and NTHMP partner participation and feedback has helped improve it and make it relevant for the user community.



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NTHMP ANNUAL MEETING

National Tsunami Hazard Mitigation Program Annual Meeting Recap

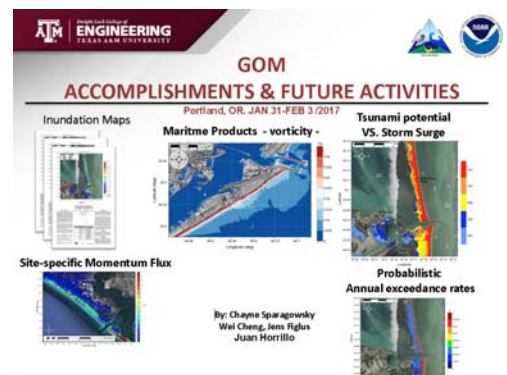
By Dr. Rocky Lopes, NTHMP Administrator

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Resilience has been a topic of conversation in the emergency management community for decades. Mike Harryman, Resilience Officer for the State of Oregon, explained how his office came to be and initiatives that he is working on to infuse resilience in Oregon state agencies.

At the end of a packed first day, Dr. Laura Kong (Director, International Tsunami Information Center) and Christa von Hillebrandt-Andrade (Manager, Caribbean Tsunami Warning Program) each provided a brief but thorough update of activities that they do to support international partners on tsunami education, outreach, training, capacity-development, and support in the Pacific, Atlantic, and Caribbean basins and around the world.

The second day of the NTHMP meeting was devoted to NTHMP partners. Twelve partners updated us on their past activities, current work, and outlook for future tsunami-related work. We were impressed by the activity and accomplishments by our NTHMP partners. The details of their activities are described in the 2016 NTHMP Annual Report, here: <http://nws.weather.gov/nthmp/documents/2016AnnualReport.pdf>



NTHMP REVIEW AND STRATEGIC PLANNING: Throughout this busy week, a team of professionals attended all meetings, asked questions, and began development of an NTHMP Review. This Review is called for every five years in the Tsunami legislation (TWEA) enacted by Congress in 2007. The purpose of the Review is primarily to inform the NTHMP Coordinating Committee on the state of the NTHMP and its strategic planning process.

There were dedicated work sessions during the week to review Outcomes and Milestones in the 2013-2017 NTHMP Strategic Plan from each subcommittee's perspective and note outcomes achieved, projects that have changed, and strategic objectives and outcomes to carry forward into the next Strategic Plan.

A Work Group to develop an updated Strategic Plan was appointed by NTHMP Chair Dr. Grant Cooper. They will read the Review and look at the notes from the dedicated strategic planning discussions to inform the next Strategic Plan. Work sessions on that project will begin in July with an anticipated delivery of a draft 2018-2022 NTHMP Strategic Plan by November for Coordinating Committee review. Final adoption of the 2018-2022 Strategic Plan will occur at the Annual Meeting next year.

COORDINATING COMMITTEE MEETING: The Annual Meetings week culminated with a 3-hour meeting of the NTHMP Coordinating Committee. During that meeting, NTHMP Chair Dr. Grant Cooper was reaffirmed for another two years of service. Subcommittee Co-Chairs elected by each subcommittee were affirmed. Other routine business was conducted. Minutes are on the NTHMP website.

NOTES AND PRESENTATIONS AVAILABLE: Copies of meeting notes and presentations are available on the NTHMP website 2017 Annual Meeting page. Visit: <http://nws.weather.gov/nthmp/2017annualmeeting/index.html>

NTHMP ANNUAL REPORT

Accomplishments of the National Tsunami Hazard Mitigation Program: An Annual Report

Authorized by NTHMP Coordinating Committee Members

National Tsunami Hazard Mitigation Program (NTHMP) 2016 General Updates

NTHMP Meetings

In addition to the two in-person meetings noted below, the NTHMP Coordinating Committee and subcommittees also met by teleconference throughout the year.

The NTHMP Annual Meeting, a preceding NTHMP-USGS collaboration workshop, and subcommittee meetings were held in Boulder, Colorado, February 1–5. Eighty-four people participated in these meetings throughout the week.

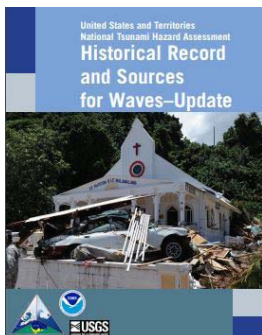
(<http://nws.weather.gov/nthmp/2016annualmeeting/index.html>)



The NTHMP Mitigation and Education Subcommittee met July 26–28 in Lynwood, Washington, with 31 attendees. The Mapping and Modeling Subcommittee did not meet in person during summer of 2016 due to insufficient travel funding. (<http://nws.weather.gov/nthmp/2016messummer/index.html>)

NTHMP Publications and Resources

United States and Territories National Tsunami Hazard Assessment Historical Record and Sources for Waves



(February 2016)—Update, authored by NOAA and the USGS

(<http://nws.weather.gov/nthmp/ushazard.html>)

(May 2016)—Two-page fact sheet and web page summarizes the Nation’s tsunami hazard based on the first U.S. hazard assessment and the 2016 update (see above)

(<http://nws.weather.gov/nthmp/%20ushazard.html>)

(May 2016)—Web page provides “one-stop-shop” for links to tsunami inundation and evacuation maps produced by NTHMP partners (<http://nws.weather.gov/nthmp/maps.html>)

Tsunami Modeling and Mapping: Guidelines and Best Practices Series (September 2016)— Existing modeling and mapping guidelines reformatted and compiled into a series, minor updates made

(<http://nws.weather.gov/nthmp/publications.html>)

Historical Tsunami Calendar (September 2016)—Two-pager lists tsunamis (reported) that affected U.S. states and territories and caused at least one death (direct or indirect) or \$1 million in damage (2016 dollars) in the United States and other significant tsunamis (<http://nws.weather.gov/nthmp/documents/tsunamicalendar.pdf>)

TsuInfo Alert (six issues)—Bimonthly newsletter that describes current work by NTHMP partners, showcases interesting reports and information, and provides links to current tsunami research (<http://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/tsunamis/tsuinfo-alert>)



World Tsunami Awareness Day Social Media (September 2016)—Messages developed for partners to use as foundation for their World Tsunami Awareness Day social media

See full report: (<http://nws.weather.gov/nthmp/documents/2016AnnualReport.pdf>)

PROJECT UPDATES

NTHMP Landslide Tsunami Model Benchmarking Workshop

By Jim Kirby, University of Delaware, and Stephan Grilli, University of Rhode Island

31 participants, representing federal and state governments, universities, and commercial entities from eight countries, gathered at Texas A&M University – Galveston on January 9-11, 2017 for the NTHMP Landslide Tsunami Model Benchmarking Workshop. The aim of the workshop was to examine the state of development of modeling approaches for landslide-generated tsunamis, and to benchmark candidate models against a chosen set of laboratory and field data sets. Results from 11 models were submitted for evaluation, and model/data comparisons highlighted the importance of including wave dispersion effects when modeling tsunami propagation away from the generation site. Workshop participants suggested that a continuing effort be made to gather more documented field cases for use in continuing model testing.

Workshop participants also benefitted from seven invited talks, including discussions of ongoing and future laboratory and field work, and discussions of the present state of knowledge of the geology of landslide deposits, rheology, and possible failure mechanisms.



Further workshop details along with copies of invited presentations may be found at the NTHMP website.

The website will be updated with analysis of submitted model results as this effort is completed.

<http://nws.weather.gov/nthmp/2017MMSLandslide/index.html>

BC Communities Hike to High Ground

By Colleen Hildebrant, Emergency Management BC

Communities along British Columbia's beautiful coastline are getting ready for the second-annual High Ground Hike to help prepare residents for the rare but real threat of a tsunami. The community-led event is held every April during Tsunami Preparedness Week and encourages people to walk, run or hike to high ground following evacuation routes.

The first High Ground Hike was held last April in Tofino, located on the exposed west coast of Vancouver Island. Local elementary school students were joined by parents, politicians, and First Nations Leaders for a one kilometre hike from Tonquin Beach to a designated tsunami refuge area. The event ended with a preparedness fair that included ShakeOutBC, PreparedBC, Ocean Networks Canada, the Canadian Coast Guard and Natural Resources Canada.



To support more communities in running events this year, PreparedBC – British Columbia's preparedness education program – has created template materials that can be easily adopted or adapted by local authorities. They include a customizable High Ground Hike logo, a planning brochure and template news releases and media advisories. To learn more about Hike Ground Hike, visit www.gov.bc.ca/PreparedBC or follow along on Twitter [@PreparedBC](https://twitter.com/PreparedBC).

PROJECT UPDATES

Cedeño (Honduras) Recognized as First Tsunami Ready Community in Central America and the Pacific

By Christa von Hillebrandt¹, Laura Kong² and Carolina Hincapie¹

¹NOAA Caribbean Tsunami Warning Program, ²NOAA International Tsunami Information Center

On February 16, 2017 the community of Cedeño (population 4363), a popular tourist destination along the Pacific Coast of Honduras, was recognized as Tsunami Ready by the UNESCO Intergovernmental Oceanographic Commission (IOC). It is the first community in Honduras, Central America and the Pacific to receive the designation, which is being implemented through a Pilot Project by UNESCO's Pacific Tsunami Warning and Mitigation System. The UNESCO-IOC Tsunami Ready program is modelled after the successful US NOAA National Weather Service's TsunamiReady® Program. In the Caribbean, St. Kitts and Nevis was recognized as Tsunami Ready by UNESCO in 2016. To achieve the



Figure 1 Evacuation of school children with their families during the PACWAVE17 Cedeño exercise.

recognition, Cedeño had to meet 10 guidelines covering hazard assessment, tsunami signage, evacuation mapping and planning, education and outreach, and 24 x 7 communications and response planning. The achievements were used in a community exercise that tested the end-to-end tsunami warning chain. On February 16 in Cedeño, with the support of the Municipality of Marcovia and the National Disaster Organization, COPECO, the Local Emergency Management Organization (CODEL) mobilized hundreds of people from schools, shops, local businesses, restaurants and homes to evacuate to two established Meeting Points. The tsunami exercise was part of the IOC's Exercise Pacific Wave 2017.

People with disabilities and the elderly also participated, demonstrating a good understanding of tsunami life protection measures, and after the evacuation, volunteers led children in tsunami educational activities. Central America has been affected by 49 tsunamis since colonial times on both its Pacific and Caribbean coastlines.

The Tsunami Ready recognition also marked the culmination of the 2-year Tsunami Evacuation Mapping, Planning and Procedures (TEMPP) Capacity Building Project for Honduras and Central America that was led by the International Tsunami Information Center (NOAA/UNESCO ITIC), with the support of NOAA's Caribbean Tsunami Warning Program (CTWP), and funded by the USAID Office of Foreign Disaster Assistance. Cedeño joins 197 TsunamiReady communities in the US and its territories and three international Tsunami Ready communities in the Caribbean who have received recognition since the program began in 2001. CTWP and NOAA's ITIC are working together with the IOC to pilot the International Tsunami Ready guidelines with other Tsunami Information Centers, in coordination with Member States and regional organizations. Currently, Tsunami Ready projects are also underway in Haiti, Grenada, and Costa Rica, and several other Central American countries. A number of Pacific Island countries have also indicated interest in participation.



Figure 2. National, Local and International Authorities with participants of the TEMPP training course at the Tsunami Ready ceremony.

PROJECT UPDATES

Meeting for Global Coordination of Tsunami Warning Systems Held in Paris at UNESCO Headquarters

Christa von Hillebrandt-Andrade, NOAA Caribbean Tsunami Warning Program

The Tenth Meeting of the UNESCO Intergovernmental Oceanographic Commissions Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG-X) took place on February 23-24, 2017 in Paris, France. The meeting was preceded by two days of meetings of the TOWS Inter-ICG Task Teams on Tsunami Watch Operations (TWO) and Disaster Management and Preparedness (DMP). The meeting was chaired by Dr. Alexander Postnov, Vice Chair of UNESCO IOC and was attended by representatives of the four Intergovernmental Coordination Groups for Tsunamis (Pacific, Indian Ocean, Caribbean and Northeast Atlantic and Mediterranean), as well as other agencies like the World Meteorological Organization and the UNISDR.

The US Delegation included Mr. Michael Angove (US Tsunami Program Manager and US National Tsunami Contact), Charles McCreery (Director of PTWC and Chair of the TWO), Laura Kong (Director of ITIC and Member of DMP) and Christa von Hillebrandt (Manager of CTWP and Chair of CARIBE EWS).



The meetings focused on advances and consolidation of global tsunami services, as well as national and local levels of tsunami preparedness efforts. All significant earthquake/tsunami events handled by the ICGs during the inter-sessional were also discussed.

The participants recognized the successful conduct of three regional tsunami exercises in the intersessional period in the Caribbean (CARIBE WAVE 16), Indian Ocean (IOWAVE 16) and Pacific (PACWAVE 17), noting especially the increase in community participation. The participants also noted with satisfaction the culmination of the 2-year Tsunami Evacuation Mapping, Planning and Procedures (TEMPP) Capacity Building Pilot Project for Honduras and Central America. This project was led by the International Tsunami Information Center (NOAA/UNESCO ITIC) with the support of NOAA's Caribbean Tsunami Warning Program (CTWP) and the UNESCO IOC Tsunami Unit. It was funded by the NOAA/NWS Tsunami Program and the USAID Office of Foreign Disaster Assistance. Over the next months, efforts will focus on preparing a TEMPP handbook that can be used by countries and their communities to implement the best practices.

The participants also discussed the advances in the implementation of the voluntary performance based community recognition program, Tsunami Ready (TR), which is modeled after the US TsunamiReady® program. Over the past year, the island state of St. Kitts and Nevis in the Caribbean and the Pacific community of Cedeño (Honduras) were both recognized by UNESCO IOC for having met the 10 recommended guidelines. In the Indian Ocean, funds are being sought to also pilot the TEMPP capacity building, and TR recognition program. In the Pacific, the Southwest Pacific Islands have established a Task Team to address Tsunami Ready. All ICGs are being invited by TOWS to continue piloting the CARIBE EWS Tsunami Ready Guidelines and report back to TOWS WG-XI for development of global guidelines.

Laura Kong and Christa von Hillebrandt shared the draft of the NTHMP Guidelines and Best Practices for Tsunami Hazard Analysis, Planning and Preparedness for Maritime Communities' document with the Inter-ICG Task Team on Disaster Management and Preparedness. There was much interest in this topic and it was agreed that this discussion needs to continue along with tsunami products of the Tsunami Service Providers for the international maritime and

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Technology and Communities Key to Curbing Tsunami Risk

By Jonathan Fowler, UN International Strategy for Disaster Reduction

PARIS, 24 February 2017 – Deploying the power of technology worldwide and ensuring that communities know how to act in an emergency are the keys to curbing the risks posed by tsunamis, experts said this week.

Senior officials from the world’s regional tsunami alert centres have spent the past four days taking stock of progress in the development and implementation of warning and mitigation systems.

They are crafting recommendations for a full session in June of the UN Educational, Scientific and Cultural Organization’s Intergovernmental Oceanographic Commission (UNESCO-IOC), which is hosting this week’s meeting at its Paris base.

Among the key themes is how to make sure the latest alert technology – for example, real-time satellite monitoring – provides coverage in all risk zones.

“It is important that the world moves forward, but we have to ensure that all countries can do so, that everyone can benefit from all the technology and data that exists,” said Dr. Vladimir Ryabinin, UNESCO-IOC’s Executive Secretary.

See full article: <http://reliefweb.int/report/world/technology-and-communities-key-curbing-tsunami-risk>



Meeting for Global Coordination of Tsunami Warning Systems Held in Paris at UNESCO Headquarters

Christa von Hillebrandt-Andrade, NOAA Caribbean Tsunami Warning Program

(Continued from Page 9)

shipping community. Also reported was the adoption of the 2016 US ASCE 7-16 Tsunami Design Provisions for high-occupancy public halls, hospitals, and other emergency buildings as a reference for the 2018 International Building Code.

Mr. Jonathan Fowler, Public Information Officer to the United Nations Office for Disaster Risk Reduction (UNISDR), gave an update on World Tsunami Awareness Day 16, and the plans and topics of future WTADs. UNISDR will be preparing materials and countries are also invited to share their materials and inform on special activities. The theme for 2017 will be “Reducing the Numbers of Affected People from Tsunamis”, which is the second of the seven targets of the Sendai Framework.

Another topic of discussion was buoy vandalism. Having noted the importance of data buoys for tsunami warnings and the consequences that data buoy vandalism has on tsunami warning operations, the TOWS appreciated the efforts of the Data Buoy Cooperation Panel in developing a regionally relevant education and outreach strategy to reduce damage to and loss of ocean data buoys from negative interactions. The next step will be for the regional ICGs (PTWS, CARIBE EWS) to review this strategy.



RESEARCH

Fifty-Year Resilience Strategies for Coastal Communities at Risk for Tsunamis

Citation: Raskin, Jay; Wang, Yumei, 2017, Fifty-year resilience strategies for coastal communities at risk for tsunami: Natural Hazards Review, v. 18, no. 1, 9 p., [http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)NH.1527-6996.0000220](http://ascelibrary.org/doi/abs/10.1061/(ASCE)NH.1527-6996.0000220).

Abstract: Low-lying coastal communities along plate boundary subduction zones face a high risk of deadly earthquakes, tsunamis, and coastal subsidence. To effectively manage the damaging impact of these events, coastal communities must develop a new vision for their postdisaster existence. New 50-year resilience master plans that strategically strengthen or relocate existing critical infrastructure, provide for clear evacuation routes, and modify land use need to acknowledge the economic realities of these coastal communities whose economies are typically based on their proximity to the ocean. The transition period outlined in the master plan must not only maintain the economic, cultural, and social viability of the community but also must embrace new modern urban development and its associated costs. This paper uses Seaside, Oregon, as the model because of its status as having Oregon's highest tsunami risk. Three scenarios are presented: (1) maintaining the status quo, in which the likelihood of a postdisaster recovery is low; (2) limited resilience, emphasizing protection of the most vulnerable population; and (3) high resilience, which requires building a new local town center protected from earthquakes and tsunamis.



Access article: [http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)NH.1527-6996.0000220](http://ascelibrary.org/doi/abs/10.1061/(ASCE)NH.1527-6996.0000220)

CURRENT TSUNAMI RESEARCH

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Jiang, Junge; Simons, Mark, 2016, Probabilistic imaging of tsunamigenic seafloor deformation during the 2011 Tohoku-oki Earthquake: Journal of Geophysical Research Solid Earth, v. 121, no. 12, p. 9050-9076, DOI: 10.1002/2016JB013760.

Judda, Karina; Chague-Goff, Catherine; Goff, James; et al, 2017, Multi-proxy evidence for small historical tsunamis leaving little or no sedimentary record: Marine Geology, v. 385, p. 204-215, <http://dx.doi.org/10.1016/j.margeo.2017.01.002>.

Kulkarni, V.; Arcos, M. E. M.; Alcinov, T.; et al, 2016, Probabilistic Tsunami Hazard Assessment for a Site in Eastern Canada: Pure & Applied Geophysics, v. 173, no. 12, p. 3719-3755, doi:10.1007/s00024-016-1414-9.

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Wood, N.; Wilson, R.; Jones, J.; et al, 2016, Community disruptions and business costs for distant tsunami evacuations using maximum versus scenario-based zones: Natural Hazards, v. 86, no. 2, p. 619-643, doi:10.1007/s11069-016-2709-y.

NTHMP NEWS & EVENTS

Tsunami Summary Reports for November 2016 Events in New Zealand and Japan

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Brief tsunami reports have been completed for the November 14, 2016 M7.8 Kaikoura, New Zealand, and November 22, 2016 M6.9 Fukushima, Japan, earthquakes. The reports, which were published through the Engineering Earthquake Research Institute (EERI) Learning from Earthquake (LFE) Program, summarize the damage and response outcomes of the tsunamis generated by these earthquakes, and highlight lessons learned about tsunami science as well as notification, evacuation, and response activities. Because LFE field teams were not deployed to investigate tsunami impacts after either event, the reports rely on the professional experience of the authors, and provide information compiled from numerous references, input from colleagues, and primary data collected during and after the event.

Neither earthquake produced large tsunamis, however the small- to moderate-sized tsunamis generated did cause minor damage to the immediate coastal areas, and provided outcomes which were noteworthy. For example, issues with tsunami detection and notification during the Kaikoura event will likely lead to changes and/or upgrades to New Zealand tsunami warning center protocols.

EERI and the co-authors felt it was important to capture information and lesson's learned about these relatively minor tsunamis which would otherwise not garner much attention by the broader tsunami community.

Link to November 14, 2016 Kaikoura, New Zealand tsunami report:

http://www.eqclearinghouse.org/2016-11-13-kaikoura/files/2017/01/EERI-Recon-Rpt-111316-NZ-tsunami_final.pdf

Link to November 22, 2016 Fukushima, Japan tsunami report:

https://www.eeri.org/wp-content/uploads/EERI-Recon-Rpt-112216-Japan-tsunami_fn.pdf



Photos showing tsunami activity and damage during the November 22, 2016, Fukushima, Japan, tsunami: a) still from video showing the tsunami surge and bores travel up the Sunaoshikawa River in Tagajo, Miyagi Prefecture (https://www.youtube.com/watch?v=svEbvJlyHeo&list=PLgIToVLZLF-Gjcy_Zs9MbuQ-Bs_ZfVBgD&index=2); b) and c) photos of damage to boats and cars. (source: The Asahi Shimbun article, dated November 22, 2016).

UPCOMING NTHMP & RELATED EVENTS

- ◆ March 7-10, 2017—EERI's 69th Annual Meeting (Portland, Oregon)
<http://2017am.eeri-events.org/>
- ◆ April 18-20, 2017—SSA 2017 Annual Meeting (Denver, Colorado)
<http://meetings.seismosoc.org/>
- ◆ December 11-15, 2017—AGU Fall Meeting (New Orleans, Louisiana)
<https://fallmeeting.agu.org/2017/>



- ◆ May 7-9, 2018—8th International Symposium on Submarine Mass Movements and Their Consequences (Victoria, British Columbia)
<http://igcp640.oceannetworks.ca/>

AGU FALL MEETING
New Orleans | 11-15 December 2017

