

State, Federal Partners Launch Cascadia Rising Exercise

By Washington Emergency Management Division

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Washington state residents will need to be prepared to be on their own following a catastrophic earthquake and tsunami. That was the take-away from a recent multi-state exercise that looked at the impacts of a Cascadia Subduction Zone disaster.

“We’re going to have to make hard decisions,” said Willie Nunn, regional administrator for FEMA Region 10. “You’re going to see a loss of life. You’re going to see injuries. You’re going to see family separations. And these are going to be hard, tough decisions. You’re going to see spontaneous volunteers, who are going to have to integrate into our response and recovery plans. This is going to have to be an all-hands-on-deck, consolidated effort and we’re all going to have to be on the same page: Life saving, life sustaining and transitioning into recovery.”

From May 3 -5, staff from the Washington Military Department, led by its Emergency Management Division, joined partners from across the Northwest at a three-day discussion-based exercise, called the Rehearsal of Concept or ROC, for the Cascadia Subduction Zone (CSZ) Earthquake and Tsunami Plan. The facilitated exercise, which drew the emergency management directors from Washington, Oregon, Alaska, Idaho and FEMA Region 10, as well as the Washington National Guard, focused on operational activities, logistics, resource management and communications for response and recovery operations for a 9.0 earthquake and subsequent tsunami. The scenario took place on a Wednesday morning in February – important because of the impacts it could have with kids in school and families separated.

Participants talked about family reunification, mass care and when supplies would start coming in.

Participants used a large 35-foot by 26-foot map to display impacted areas and demonstrate resource allocation, staging, and movement in response to a CSZ event. Knowing many roads, bridges, buildings and other infrastructure will be damaged or destroyed, the movement of supplies and emergency personnel is challenging. This exercise discussed these challenges and worked toward solutions.



The map included giant moveable icons that included resources such as fuel, mobile hospitals and search and rescue teams that could be moved from place to place.

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TsuInfo Alert

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NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:

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FEMA and staff say the priority is figuring out what roads are essential to reopen to get supplies to those who need it most. The map displayed different colors for roads. Blue means it might be passable. Orange means it's not likely.

And if roads can't be reopened, how else can supplies be sent? Air drops? By boat? Solutions and strategies to address that concern were discussed, along with how to conduct evacuations when roads are impassable.

There are two strategies at work: With no fuel available, is it possible to get fuel in and empower people to use their own vehicles to evacuate? If not, planners have to figure out strategies to get people out.

"There is help coming, lots of help coming," Robert Lantz-Brazil, a logistics specialist with FEMA told those gathered while standing on the giant map. "And I hope that's evidenced. This isn't everything we're tracking. There's even more resources coming."

Days after the earthquake, it's clear in the exercise that people are vulnerable and day by day things are deteriorating as fast as the area around them

Stacey McClain, operations unit manager at EMD, noted that site surveys are being done now to figure out where military helicopters could land.

"Helicopters don't go across mountains very well," McClain said during the exercise. "If Sea-Tac Airport is operating, that's great. If not, what's the best place to take them?"

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Boise might be available. But if there is a mass exodus, reception centers might need to be set up in Arizona or Utah.

“Eastern Washington is not set up to take millions of people,” Sharon Wallace, deputy director of EMD, told those at the exercise. “Having a repatriation plan is essential. Where are we going and when are we coming back? The goal is to get the survivor home.”

The first Cascadia earthquake plan was published in 2013 and was tested in the Cascadia Rising 2016 Exercise (CR16). The plan was updated in 2017 to address power outages and lessons learned from CR16. Lessons learned from the Cascadia Rising 2022 ROC exercise will be incorporated into the plan’s next update.



“What we’re doing has genesis in what we did six years ago when we did the first major Cascadia Rising exercise,” said Washington EMD Director Robert Ezelle. “We learned about the fragility of our critical infrastructure, our transportation systems, communications, energy. We learned the critical importance of mass care. We learned the importance of public health and medical needs of people. So, coming out of that exercise, we have done a ton of work at the federal level, at the state level and at the local level.”

One takeaway from CR16 was the need for residents to be prepared to be self-sufficient for a longer period – up to 14 days. Learn preparedness tips at mil.wa.gov/preparedness.

“One of the overarching things we’re trying to communicate, not just among ourselves, is the responsibility for individuals, communities, families in Oregon and Washington to be prepared,” said Andrew Phelps, director, Oregon Office of Emergency Management. “We’re doing these exercises to prepare our communities, our infrastructure providers, our federal partners. We’re asking Oregonians and Washingtonians to do those same things, as well. Think about what they’re going to need for the first one week, two weeks, three weeks after an emergency and disaster, knowing we’re not going to have water or sewer, we’re not going to have communication and energy. What do you and your family need to do to be disaster survivors, not disaster victims? That’s a really important piece of the puzzle.”

The update to the Cascadia earthquake plan was completed in January. It is a multistate federal response plan that addresses a no-notice catastrophic earthquake disaster with expected direct and indirect impacts to Washington, Oregon, Alaska, Idaho, California and Canada.

The plan focuses on the first 14 days after a CSZ event when every level of government and private sector will immediately provide resources to respond and support the needs of survivors.

Exercise participants for the CR22 ROC include FEMA Region 10, FEMA Headquarters through the National Response Coordination Center, Department of Defense, American Red Cross, Tribal partners, states of Alaska, Idaho, Oregon, Washington and Emergency Management British Columbia.

Link to original article: <https://mil.wa.gov/news/state-federal-partners-launch-cascadia-rising-exercise>

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Tsunami Awareness Month in the State of Hawai'i

By Hawai'i Tsunami Awareness Month Committee
(NOAA, Hawai'i Emergency Management Agency, Counties of Kaua'i, Honolulu, Maui, Hawai'i
Emergency Management / Civil Defense Agencies, University of Hawai'i, Pacific Tsunami Museum)

April is Tsunami Awareness Month (TAM), the month of the year to remember Hawai'i's worst tsunami. It was April 1st of 1946 when an M 8.6 earthquake occurred in the Aleutian Islands of Alaska. Near the source of the earthquake, at Unimak Island, huge tsunami waves reached more than 100 feet above sea level and destroyed completely the newly built U.S. Coast Guard's Scotch Cap lighthouse. The tsunami arrived ~4.5 hours in Hilo after it was generated. Tsunami runups of up to 16 m were observed. Statewide, 158 people lost their lives, with \$337.2 million (adjusted for inflation to 2021 dollars) in damage.

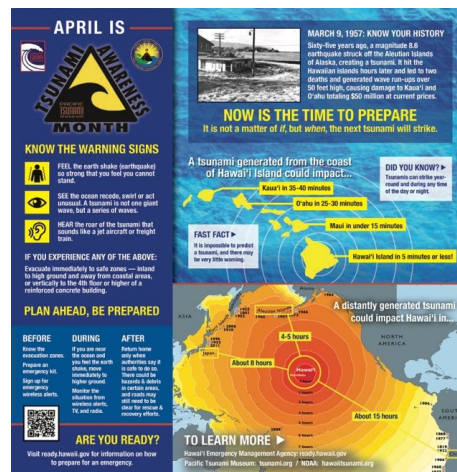
Since the 1990's, the TAM Committee, comprised of Federal and Local Agencies, has worked together to remind communities and the public that tsunamis are one of the most dangerous natural hazards - they are very destructive, there is no season, they can happen any time and be generated locally as well as from the Pacific Ring of Fire, and everyone should be prepared (i.e. know the tsunami evacuation zones, have a family emergency plan and a 14-day emergency kit as well as a Go-Bag).

Different activities were conducted during April, extending into May and June, as part of Tsunami Awareness Month ([TAM 2022](#)). The International Tsunami Information Center (ITIC), Hawai'i Emergency Management Agency (HI-EMA), University of Hawaii/Hilo Center for the Study of Active Volcanoes (UH/Hilo CSAV), Pacific Tsunami Museum (PTM) and Honolulu Department of Emergency Management (Honolulu DEM) took advantage of their social media outlets (such as Facebook and/or Twitter) to educate and share interesting tsunami facts with the public. The HI-EMA released an animated tsunami Public Service Announcement (PSA) with closed captioning in [Japanese and Tagalog](#), expanding the resources available to prepare all Hawai'i residents and visitors. In early April, the PTM reopened their facilities after being shuttered for two years because of the COVID pandemic, and welcomed all First Responders and their families to visit them for free. The UH/Hilo CSAV offered virtual and in-person tsunami preparedness talks to elementary schoolers and the Sea Grant program in collaboration with the Hawai'i State Department of Education's Safety, Security and Emergency Branch debuted an updated [Tsunami Preparedness Video](#) that will be mandatory viewing for all teachers and staff.

This year as COVID restriction in Hawai'i were relaxed, a number of agencies attended in-person awareness events to provide tsunami safety information. Five Preparedness and Safety Fairs on the island of O'ahu and one on Maui were held, with approximately 1000 people attending these events.

Additionally, the ITIC delivered more than 800 tsunami packets with awareness materials for students and teachers of schools located on the islands of O'ahu and Hawai'i.

Another effective activity conducted by HI-EMA, PTWC and the ITIC, was the interactive virtual presentation *Tsunamis Live Hawai'i* using the Kahoot game-based learning platform. Kahoot is an innovative and popular learning tool where kids have fun in 'real-time', with quizzes testing their comprehension of the 'tsunami facts' popping up after each concept was taught. The activity was very well received for the teachers and students of 4th grade (four session / 83 students in total) and feedback from the teacher reported that the topics covered aligned well with the materials reviewed in their science classes.



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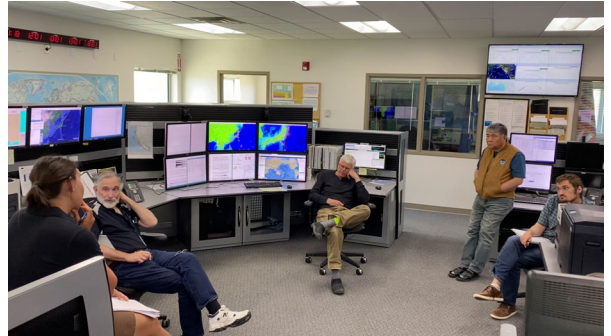
NTWC Supports U.S. & Canadian Atlantic Coast Preparedness with Enhanced LANTEX22 Exercise

By Summer Ohlendorf and David Snider, U.S. National Tsunami Warning Center

The U.S. National Tsunami Warning Center (NTWC) held its 2022 LANTEX exercise for the Atlantic coasts of the continental U.S and Canada on June 1, 2022. Along with its sister exercise PACIFEX for the U.S. & Canadian continental Pacific coasts, this exercise promotes preparedness for tsunami events among a broad range of NTWC partners and customers. This is the 11th year a LANTEX exercise has been held, and the 2022 exercise debuted several new interactive features that provided practice for NTWC staff as well as a better understanding of NTWC decision support for core partners.

New elements this year:

- Revised workbook structure with Executive Summary and additional helpful information
- NTWC release of multiple messages by email at realistic timing
- Four live conference calls hosted by NTWC scientists
- NTWC live support in a Google Chat room for NOAA/NWS partners
- A source location that has not been used in a previous LANTEX exercise, with a size and location that sends tsunami energy into the Gulf of Mexico
- Post-exercise survey to collect feedback and ideas for next year



NTWC scientists regroup after the LANTEX22 exercise to discuss action items and ideas for future exercises

The 2022 exercise used a unique tsunami source in the NW Caribbean Sea that was designed to propagate modest tsunami energy into the Gulf of Mexico. Realistically, the full earthquake magnitude was not captured by the time the first bulletin was issued. An earthquake magnitude upgrade turned this from a Tsunami Information Statement specifying potential danger in message #1 to an Advisory level event in the Gulf of Mexico in message #2. Though this particular earthquake source is unlikely, nearly every tsunami event has at least one element of surprise, and this one makes a good thought exercise. The modeling and timing of information flow into the messages were consistent with the source selection. This scenario also demonstrated a case in which deep ocean measurements would not be available for producing a tsunami forecast quickly and highlighted the challenges a similar event could pose for refining the tsunami alert area.

The exercise kicked off with a variation on NTWC's monthly Communications Test at 8am AKDT/ Noon EDT. Participants were encouraged to play along in real time, even if their area was not forecast to receive significant impacts from this exercise source. That included East Coast partners, who had NTWC actively evaluating their level of danger during the early stages of the exercise. Participants in the live exercise included several Weather Forecast Offices, several state emergency management agencies, and Environment and Climate Change Canada.

In conjunction with the exercise, NTWC worked to update its contact lists and identified multiple areas for improvement in its operations and decision support. NTWC encourages all of its partners to complete the post-exercise survey, whether they participated in the exercise or not, letting NTWC staff know how they can more effectively support tsunami training and preparedness. NTWC will continue to build on this year's exercise to craft a better 2023 exercise, and lessons learned from LANTEX22 will translate into more effective alerting during the next real Atlantic basin tsunami event.

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Tsunami Siren Reinstallation Project Underway

By Regina Browne, Virgin Islands Territorial Emergency Management Agency (VITEMA)

After the success of the 2022 Caribe Wave drill in the U.S. Virgin Islands territory, VITEMA has actively been engaging the Tsunami Working Group that contains members from the agency, other territorial agencies, along with federal and local subject matter experts. The group has been meeting weekly, ensuring the proper focus and dedication to the prevalent threat and risk of tsunamis that can affect the territory is always at the forefront in all preparedness activities. Due to the constant engagement by the agency director and assistant director, the reinstallation of the Tsunami Siren Project across the territory has occurred. It is slated to be completed in the upcoming months. The project will lead to the ability to test the siren's functionality on a regular basis and to ensure the resilience of emergency communications. VITEMA reminds the community that tsunami preparedness in the territory is a constant and ongoing process that must be continuously practiced because it is a no-notice event. VITEMA will continue to work towards accomplishing its mission to save lives and protect the property of the territory's population from threats and risks from natural and man-made hazards. Townhall meetings will be scheduled throughout the territory to ensure they capitalize on community engagement through a whole community approach. Also, Tsunami Walks will be occurring over the next few months at critical communities in the Tsunami Zones to provide educational information and to identify safe elevation points or other inland locations. They will ensure the territory remains prepared and resilient through planning, coordinating, training, and exercising. VITEMA's motto: Be Prepared, Stay Informed and Be Vigilant.



Tsunami reinstallation by Deputy Director of Logistics, Stephen Deblasio, the project lead.

USGS Powell Center Working Group on Tsunami Sources – Cascadia Workshop

By Marie Eble, NOAA Pacific Marine Environmental Laboratory (Retired)

The USGS Powell Center Tsunami Sources Working Group met in Fort Collins, Colorado the week of 9-13 May to evaluate known and plausible sources of tsunamis generated along the Cascadia subduction zone. Remote and in-person expert participants shared current knowledge and discussed how best to quantitatively define and weight relevant source parameters such that all probabilities would be captured within a logic tree framework. A logic tree for the Cascadia subduction zone was conceptualized during the meeting and is under continued development in collaboration with participants. The logic tree and resulting probabilistic tsunami hazard analysis information will help states develop maps and products based on different hazard levels representing various average return periods or intervals.



Remote and in-person participants in the Cascadia subduction zone tsunami sources regional meeting.

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Working with Our Maritime Partners: Getting Life-sustaining Resources to Survivors After Catastrophic Disasters

By Sasha Rector and Sheri Badger, King County Office of Emergency Management

On May 24, 2022, King County Office of Emergency Management (OEM) hosted a Regional Maritime Resiliency Workshop, bringing together maritime and emergency management entities from across the Puget Sound region to discuss coordination efforts after a large-scale disaster.

The workshop, held at the Foss Maritime Center on the waterfront in Tacoma, was attended by more than 110 professionals from six port areas (Bellingham, Bremerton, Everett, Olympia, Seattle, and Tacoma), representing more than 100 public and private agencies. The workshop is just one element of a greater preparedness effort being undertaken by the region.

In October 2020, King County OEM was awarded a FEMA grant, under the Regional Catastrophic Preparedness Grant Program (RCPGP). The grant focuses on sustaining survivors after a catastrophic event, like a Cascadia subduction zone earthquake. King County is facilitating the project on behalf of the Regional Catastrophic Planning Team (RCPT) which is comprised of emergency management professionals from multiple counties, cities, organizations, and a tribal nation from the Puget Sound region.

The ultimate goal of this RCPGP project is the development of a Maritime Disaster Resilience Framework, which will increase the Food, Water, and Sheltering Community Lifeline through the enhancement of the Logistics and Supply Chain Management core capability in the possible event of a Cascadia subduction zone earthquake and ensuing tsunami as well as for other disasters. This project works as part of a three-prong approach with Snohomish and Pierce Counties leading the other two projects.

This RCPGP project is being conducted in two phases. The first phase began with stakeholder engagement and the facilitation of six port area workshops. These workshops were held virtually between February and April 2022 for the areas of Bellingham, Bremerton, Everett, Olympia, Seattle, and Tacoma. Participants for these workshops included county and local emergency management agencies, port and marina operators and emergency management, dive and salvage companies, shipping companies, transit organizations, the US Coast Guard, and the US Navy.

Each workshop included presentations from Washington Geological Survey and Washington Emergency Management Division describing the threats and anticipated impacts of a Cascadia subduction zone earthquake as well as what the Puget Sound could expect from near-source and distant-source tsunamis. These presentations established a projection of needs the Puget Sound will incur when “the big one” happens. These workshops also included discussions regarding local response planning, communication and information sharing, and an initiative the local community wanted to share. Many conversations identified planning and processes already in use as well as gaps in capabilities. Communications was a gap identified during a large-scale, long-term power outage across all six workshops.

This in-person and virtual Regional Maritime Workshop on May 24 allowed for the discussions from the six port areas. It was an opportunity for the maritime and emergency management sectors to get to know one another and begin much needed coordination conversations.

Phase II of the project will focus on the completion, training, testing, and socialization of the Maritime Resilience Framework. Current planning for this phase includes continued outreach to the maritime and emergency management communities, identification of current planning efforts beneficial to the overall goal of the framework, and identification of smaller ports and possible landing sites for the transfer of life-sustaining commodities from water assets to land assets. A completed Framework is expected for August 2023.

For more information regarding the project, please contact Sasha Rector at:

srector@kingcounty.gov or visit www.kingcounty.gov/RCPGP.

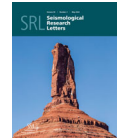


TSUNAMI RESEARCH & EVENTS

RESEARCH

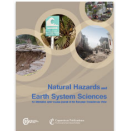
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UPCOMING NTHMP & RELATED EVENTS

- ◆ July 18-22, 2022—NTHMP Summer Meeting (Palm Springs, CA)
<https://nws.weather.gov/nthmp/index.html>
- ◆ September 12-17, 2022—AEG Annual Meeting (Las Vegas, NV) <https://www.aegannualmeeting.org/>
- ◆ October 9-12, 2022—Geological Society of America (Denver, CO)
<https://community.geosociety.org/gsa2022/home>
- ◆ December 12-16, 2022—AGU Fall Meeting (Chicago, IL) <https://www.agu.org/fall-meeting>

