



Updates from the American Samoa NTHMP

By Aukusitino Steffany, Tsunami Program Liaison American Samoa
 Department of Homeland Security (ASDHS)

IN THIS ISSUE:

Updates from the American Samoa NTHMP	1
Community Resilience Analysis Facing Tsunami Disasters in PR	3
First Tsunami Ready Communities in Saint Lucia and Dominica	5
CNMI Finalize their Tsunami Alerting and Response Timelines	6
Guam Finalizes Repairs on All-Hazard-Alert-Warning-System	7
Earthquake & Tsunami Booth at the 2024 Humboldt County Fair	8
Northern California DisasterCon 2024	9
UNESCO-IOC Tsunami Awareness Course	9
Tsunami Evacuation Walk Time Maps for WA	10
Makah Tribe's Port of Neah Bay Tsunami Maritime Response and Mitigation Strategy	11
Tsunami Research	13
NTHMP Related Events	13

Tsunami Preparedness Week

Tsunami Preparedness Week took place from September 22-27, 2024. The American Samoa NTHMP conducted outreach at the South Pacific Academy school, and within the Tongan Community, and Asian Community. The American Samoa NTHMP also worked with the GIS Team from the Department of Commerce (DOC) to present the Tsunami Evacuation Maps for Seven (7) Villages to the Territorial Emergency Management Coordination Office (TEMCO). These maps have been in the works since last year and are solely funded through the NTHMP Program. On the last day of Tsunami Preparedness Week, American Samoa NTHMP hosted an awareness wave in front of McDonald's located in Tafuna, to promote emergency preparedness. Attendees at the wave were the staff of ASDHS, personnel from the Department of Health, the Asian Community, and also the village council that was a part of the Adopt-A-Village Project that was under the NTHMP Program.

Geographical Information Systems (GIS) Day

On September 12, 2024, the American Samoa NTHMP was invited to be a part of "GIS DAY" which was hosted by the Department of Commerce. This event was for students from different schools around American Samoa to show the significant role that GIS has for our community and the local government departments that have worked alongside the GIS Team on projects that benefit our community. The American Samoa NTHMP spoke with students about the project they have been working on with the GIS Team creating tsunami evacuation maps for the local villages. The American Samoa NTHMP also took the time to conduct additional tsunami outreach.



3rd Annual Disaster Resilience Summit

September 3-6, 2024, was the annual Disaster Resilience Summit that was hosted by the Office of Disaster Assistance and Petroleum Management (ODAPM). This event brought together government officials and humanitarian organizations focusing on advancing strategies for disaster preparedness, response and recovery for the communities. The American Samoa NTHMP participated in this event, promoting tsunami awareness to all those in attendance.



TsuInfo Alert

Prepared and published bimonthly by the Washington State Department of Natural Resources, Washington Geological Survey, on behalf of the National Tsunami Hazard Mitigation Program (NTHMP), a state/federal partnership led by the National Oceanic and Atmospheric Administration (NOAA).

This publication is free upon request and is available in print by mail and online at:

<http://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/tsunamis/tsuinfo-alert>

**Assembled and edited by Stephanie Earls,
Librarian, Washington Geological Survey
Washington Dept. of Natural Resources**

1111 Washington St. SE, MS 47007

Olympia, WA 98504-7007

360-902-1473 (p) 360-902-1785 (f)

stephanie.earls@dnr.wa.gov



NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:

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

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.

Updates from the American Samoa NTHMP

By Aukusitino Steffany, Tsunami Program Liaison American Samoa
Department of Homeland Security (ASDHS)

(Continued from page 1)

National Tsunami Hazard Mitigation Program Annual Summer Meeting

This year, American Samoa hosted the National Tsunami Hazard Mitigation Program (NTHMP) Annual Summer Meeting from July 23-25, 2024. Staff from the National Weather Service (NWS), Weather Service Office (WSO) Pago Pago, and the American Samoa Department of Homeland Security (ASDHS) hosted this event. In attendance, were representatives from the NWS Tsunami Program, and 40 individuals who represented the various NTHMP partners and partnering federal agencies. This was the first-ever NTHMP meeting hosted on a U.S. island territory in the Pacific. On the first day, NTHMP members met with the U.S. Army Major Hanna Vaouli, who briefed the attendees on the Samoan Culture. After the briefing, the NTHMP members, joined by Honorable Governor Lemanu P.S. Mauga, went to the village of Leone to attend the Samoan Ava Ceremony, which was hosted by the Leone Village Council. After the Samoan Ava Ceremony, the NTHMP members toured the Leone Healing Gardens where they learned about the stories of the families that were affected by the tsunami that occurred on



(Continues on page 3)

NTHMP PARTNER UPDATES

Updates from the American Samoa NTHMP

By Aukusitino Steffany, Tsunami Program Liaison American Samoa
Department of Homeland Security (ASDHS)

(Continued from page 2)

September 29, 2009. Following this event, NTHMP members were escorted to the Ocean Center in Utulei, in which the Honorable Governor Lemanu P.S. Mauga gave an opening speech to officially start off the NTHMP conference. On the final day of the NTHMP Annual Summer Meeting, the NTHMP members visited the NOAA Observatory in the village of Vatia. After the tour of NOAA Observatory, they visited Pago Pago where they met with the Pago Village Council that shared stories of how their village was affected and how the tsunami impacted their livelihood.

Upcoming Events

- The American Samoa NTHMP will be conducting “Phase 4” of the siren maintenance in Tutuila, Aunu’u, and the Manu’a Islands during October. This is to ensure that all outdoor sirens are fully functional.
- The American Samoa NTHMP will be conducting outreach along with the GIS Team from the Department of Commerce on the Tsunami Evacuation Maps placed at the Seven (7) Villages. These maps will be presented to the village council of the Seven (7) Villages to help inform the public about their significance.

Community Resilience Analysis Facing Tsunami Disasters in Puerto Rico

By Wildaomaris González Ruiz, Puerto Rico Emergency Management Bureau (PREMB)

Tsunami resilience in Puerto Rico is something that has been difficult to measure since we haven't experienced a tsunami since 1918. Earlier this year, we began a pilot project to determine how tsunami-resilient our coastal communities or agencies are. We distributed the tsunami resilience questionnaire to two agencies within the tsunami evacuation zone. The first agency is the commercial office of AAA at Aguadilla, who have been recognized as a TsunamiReady® Supporter four years ago. The second was the Department of Agriculture in Mayagüez, with whom we (the Puerto Rico Tsunami Preparedness Team) have not worked or trained in tsunami preparedness issues.

From AAA office, 8 employees of the agency's 26 employees answered the questionnaire. Every day this office received around 200 visitors of all ages. The office has 3 managers, 6 supervisors and 17 employees who have developed an emergency committee that work with the emergency plans. Three of the employees have physical impairments that make it difficult for them to move around, and many of the daily visitors are more vulnerable due to age and physical impairments. The 6-story building in which they are located is 0.15 miles from the sea. **Figure 1** shows the AAA location and the distance from the sea. In case of a



Figure 1: AAA location and the distance from the sea.

(Continues on page 4)

NTHMP PARTNER UPDATES

Community Resilience Analysis Facing Tsunami Disasters in Puerto Rico

By Wildaomaris González Ruiz, Puerto Rico Emergency Management Bureau (PREMB)

(Continued from page 3)

tsunami warning, they have decided to do a vertical evacuation going to the sixth floor of the building (from the first floor where they are located) since the nearest recommended evacuation route is steep, narrow and they must cross a mountain area. Their proper assembly point is at the Aguadilla Mall about 0.38 miles away. According to the results of the questionnaire, the AAA office in Aguadilla is **near to tsunami resilience**. That implies that long-term actions have been carried out, to be better prepared for a tsunami emergency, with some shortcomings.

According to survey responses, most AAA employees are aware of the risk they are exposed to, know the evacuation route to follow, know about tsunami warning systems and tsunami evacuation maps, have participated in tsunami evacuation exercises to practice the plan, and have attended talks on the topic. All employees reported that they know that the agency has a tsunami evacuation plan. Where the survey shows that AAA could improve are in the number of emergency backpacks, the number of employees who have taken the CERT training, and the number of ways to receive tsunami warnings and to disseminate them.



Figure 2: Department of Agriculture location and the distance from the sea.

On the other hand, in the Department of Agriculture of Mayagüez, 13 employees out of a total of 18, participated in the survey. Every day the office received between 40 to 50 visitors. The office has a regional director, program director, supervisor, administrative staff, and employees. They don't have an emergency committee. The 2-story building in which they are located (on the second floor) is around 0.69 miles from the sea. **Figure 2** shows the Department of Agriculture location and the distance from the sea. Their proper assembly point is at the public plaza 0.62 miles away. According to the results of the questionnaire, the Department of Agriculture at Mayaguez is **low resilience**. That implies that they only have some awareness about tsunamis and little action has been taken to be ready for a tsunami emergency. According to survey responses, most Department of Agriculture employees are aware of the risk they are exposed to and have a map of the facilities, but most employees don't know the evacuation route to follow, don't know about tsunami warning systems and tsunami evacuation maps, haven't participated in tsunami evacuation exercises, don't know if the agency have a tsunami evacuation plan and haven't been to talks on the topic. The survey shows that Department of Agriculture at Mayaguez has many areas to improve the preparedness of their employees and visitors in case of a tsunami warning to create more resilience, and therefore save the lives of the employees and visitors during a tsunami emergency. We recommended that they participate in tsunami evacuation exercises, and to allow our tsunami team in PR to help them in the development of a tsunami response plan, train their personnel, and lastly to achieve the recognition as a TsunamiReady® Supporter community so they can be more resilient like the AAA's agency who has worked with us in the preparation of its employees in the past years. Tsunami resilience involves effort, changes, improvements, interaction between the different agencies involved in tsunami preparedness and above all, understanding the danger to which they are exposed and having the desire to save lives during the emergency. A reduction in funding for Puerto Rico's tsunami program is devastating to meeting the goal of having more tsunami-resilient communities. Communities benefit greatly from having our technical and professional support in their tsunami preparedness process.

NTHMP PARTNER UPDATES

UNESCO/IOC Recognizes First Tsunami Ready Communities in Saint Lucia and Dominica

By Christa von Hillebrandt-Andrade (International Tsunami Information Center-Caribbean Office) and Regina Browne (Virgin Islands Territorial Emergency Management Agency)

The communities of Laborie, Saint Lucia and Portsmouth, Dominica were recognized as Tsunami Ready by the UNESCO Intergovernmental Oceanographic Commission (IOC). Ceremonies were held on September 24 and 26 respectively to celebrate these two communities, which are the first to be recognized in their respective countries. Participating in the ceremony were two NTHMP Coordinating Committee members, Christa von Hillebrandt-Andrade of the International Tsunami Information Center-Caribbean Office, project lead and Regina Browne of the Virgin Islands Territorial Emergency Management Agency in representation of UNESCO/IOC and its Intergovernmental Coordination Group for Tsunamis and other Coastal Hazards for the Caribbean and Adjacent Regions (CARIBE-EWS).

Laborie is a fishing community of 7,363 people located on the southern shores of Saint Lucia. It faces tsunami threats from local earthquake sources, submarine landslides and neighboring volcanoes, including Kick 'em Jenny. The Laborie District Disaster Management Committee led the implementation process, which took over two years. The Boys' and Girls' Primary School participated in awareness, preparedness and response activities and attended the ceremony. In addition to radio and instant messaging to disseminate alerts, traditional methods like church bells, and conch shells are used to alert the population. The ceremony coincided with the homecoming of Julien Alfred, Olympic Gold and Silver Medalist in the 100 m and 200 m races. As the reigning champion, there are hopes that she could serve as a spokesperson for tsunami response.



Students of the Laborie Boys' Primary School with the Tsunami Ready Project Local Facilitator and teacher, Mr. Denis Hunte.

Portsmouth is the second largest town in Dominica, with 3,630 inhabitants located on the Northwest corner of Dominica. It hosts a very popular sailing event, Sail Portsmouth, during which tall ships from around the world anchor in the natural harbor. Portsmouth was chosen by the national authorities to implement the program because of tsunami travel times as short as four minutes and significant flooding according to the country-wide tsunami hazard assessment conducted by the Tsunami Warning Center of Costa Rica as part of the project. Her Worship, the Mayor Kerry Prince was instrumental in ensuring a whole community approach for the implementation of the Tsunami Ready program. Fisher folk, health professionals, fire and police officers, local residents and schoolchildren were all engaged. They provided input on the evacuation map, identifying key sites for signage and participating in community exercises.

Saint Lucia and Dominica expressed their gratitude to the US government for technical and administrative support provided by the International Tsunami Information Center Caribbean Office and for the funding from the US Agency for International Development (USAID). Both countries look forward to implementing Tsunami Ready in their other at risk communities.

NTHMP PARTNER UPDATES

CNMI Joins the Growing List of NTHMP Partners to Finalize their Tsunami Alerting and Response Timelines

By Ethan Weller, Washington Emergency Management Division

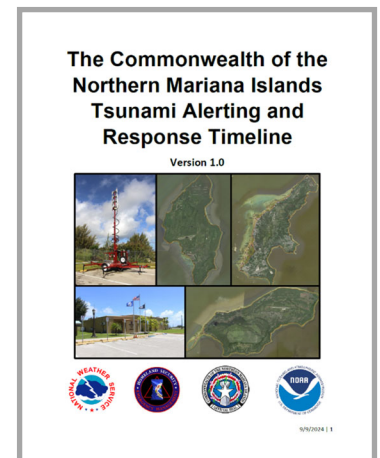
Early in September, the Commonwealth of the Northern Mariana Islands (CNMI) finalized their Tsunami Alerting and Response Timeline. For the avid TsuInfo reader, you may remember from the [August issue](#) that these timelines provide a comprehensive look into how tsunami alerts flow from the Tsunami Warning Centers out to the public and document the initial response actions that all levels of government and their critical partners take upon receipt of a tsunami alert. The timeline documents who receives the alerts, who has responsibility for disseminating alerts at each step, and what specific methods and software are utilized to send out these alerts. This project was a collaborative effort with CNMI's Department of Homeland Security and Emergency Management and Chip Guard, with input from the National Weather Service Weather Forecast Office in Guam and Coast Guard and Navy personnel from the Joint Base Marianas. By sharing existing tsunami-related procedures, processes, and products, an important foundation was established that CNMI can now use to improve their planning and preparedness efforts, not only for tsunamis but other hazards as well.

This collaborative effort is part of the ongoing tsunami portion of the [NWS' Hazard Simplification Project](#), in which NOAA is evaluating how the public perceives and acts on their various tsunami-related alerts. Washington Emergency Management hired a Tsunami Program Coordinator to oversee the project as their tsunami program was the first to create a Tsunami Alerting and Response Timeline after the January 2018 7.9 Magnitude earthquake in Alaska created the need for a clearer understanding of how the alert process works. Washington's document provided critical information for the creation of templates for both National and Pacific Tsunami Warning Center partners.

Thanks to funding from the NTHMP, over the course of the past year Washington's Tsunami Program Coordinator was able to help lead the documentation process and coordinate with the CNMI experts to create this document. Although the document is finished, the work is far from complete. This timeline represents a "snapshot" into tsunami alerting and response for CNMI and will need to be updated on a consistent basis as improvements or alterations to existing processes and procedures are established.

Utilizing the information captured, the next phase of the project will require continuous collaboration to identify gaps in services and support for CNMI's tsunami program, and the challenges that create barriers to improving CNMI's processes. Gathering this information from not only CNMI, but all NTHMP partners will allow all programs to identify exactly what they need to start addressing these gaps. Cross-cutting needs will be discussed within the Warning Coordination Subcommittee (WCS) and then projects will be incorporated into the WCS workplan.

These timelines represent an important first step in working to improve tsunami resilience across the nation. Federal, tribal, state, and territorial governments can utilize the information documented within the Tsunami Alerting and Response Timelines to improve their services, planning efforts, and coordination with critical partners and those they serve to create lasting, positive change within their respective jurisdictions. Working together in tsunami alerting and response is a crucial step in ensuring that communities are resilient to reduce the impacts of local and distant tsunamis and as many lives are saved as possible.



NTHMP PARTNER UPDATES

Guam Finalizes Repairs on All-Hazard-Alert-Warning-System

By Stephen Cahill, Tsunami Program Manager, Guam Homeland Security

In May 2023, Guam faced the devastating impact of Typhoon Mawar, a storm that not only wreaked havoc on the island's infrastructure but also severely compromised the All-Hazard Alert Warning System (AHAWS). With only two of the twenty-four sirens operational post-storm, the urgency for repair and restoration was paramount. The swift and coordinated efforts through the NTHMP program have led to the successful completion of repairs, significantly enhancing the island's emergency preparedness.

The Guam Office of Homeland Security (GHS/OCD) took the lead in assessing the damage and coordinating the repair efforts. This involved not only repairing the damaged sirens but also upgrading obsolete parts with newer technology to ensure reliability and effectiveness in future crises.

By the end of September 2023, all twenty-four sirens were successfully repaired and fully operational. This achievement marks a significant milestone in Guam's emergency preparedness efforts. The restored AHAWS provides a robust layer of safety for residents, ensuring they will be alerted promptly in the event of a natural disaster or other emergencies. The sirens are now equipped with enhanced capabilities, allowing for clearer sound transmission and a broader range of alerts, including severe weather warnings, tsunami notifications, and other critical emergency information.



Community involvement played a vital role in this restoration process. Local residents participated in informational sessions, learning about the AHAWS and its importance in safeguarding their lives and properties. These sessions not only educated the public on emergency preparedness but also fostered a sense of shared responsibility in ensuring community resilience against future disasters.

In conclusion, the successful repair of Guam's All-Hazard Alert Warning System following Typhoon Mawar underscores the island's commitment to public safety and emergency preparedness.

The collaborative efforts of local and federal agencies, coupled with active community participation, have revitalized a critical component of Guam's disaster response strategy. As the island moves forward, the fully operational warning system serves as a testament to resilience and a reminder of the importance of readiness in the face of natural disasters. Guam is now better equipped to protect its residents and respond effectively to future emergencies, reinforcing the idea that preparedness is a community endeavor.

NTHMP PARTNER UPDATES

Redwood Coast Tsunami Work Group - Earthquake and Tsunami Booth at the 2024 Humboldt County Fair

By Todd Becker, Cal OES; Amanda Admire, RCTWG/Cal Poly Humboldt

A long-standing tradition in Humboldt County, California is the Humboldt County Fair, the “oldest uninterrupted county fair” in California. Not quite as old as the fair itself, but a tradition going back to the 1990s is the Earthquake and Tsunami Booth coordinated by the Redwood Coast Tsunami Work Group (RCTWG). While the size of the booth has varied over the years, the goal of community engagement has remained the same.

The RCTWG Earthquake and Tsunami Booth has been a vital resource throughout the years in engaging and educating the community about earthquake and tsunami hazards throughout Northern California and Statewide. The RCTWG is an organization of local, state, tribal and federal agencies, nongovernmental organizations, and businesses from Del Norte, Humboldt and Mendocino Counties. This year, RCTWG volunteer members planned, setup, and staffed the Earthquake and Tsunami Booth for over two weeks from the end of August through the beginning of September 2024.



Redwood Coast Tsunami Work Group Members after setting up the Earthquake and Tsunami booth for the 2024 Humboldt County Fair. L – R: Linda Nellist, Todd Becker, Cheyenne Bailey, Megan Bryant, and Amanda Admire.

Each year a theme is identified which helps to guide the planning of the booth’s content and layout. This year, the Earthquake and Tsunami Booth highlighted and distributed the RCTWG’s brand new 2024 edition of Living on Shaky Ground. Completely revised, the 2024 edition of Living on Shaky Ground includes information on recent earthquakes and tsunamis, the ShakeAlert earthquake warning system, and more background content on why California’s North Coast is the shakiest place in the lower 48 states. This handbook explains how you can prepare for, survive, and recover from earthquakes and tsunamis. It also describes what you can do today to save lives, reduce injuries, and minimize damage.

You can download an interactive copy of the Living on Shaky Ground PDF at this link: <https://rctwg.humboldt.edu/prepare/shaky-ground>.

The Earthquake and Tsunami Booth also included informational displays from CERT (Community Emergency Response Teams), CalOES, and the National Weather Service, in addition to other RCTWG materials.

The RCTWG also maintains a “Virtual Fair” on their website to provide year-round and remote access to the great information that is often available at the fair. Link to RCTWG Virtual Fair: <https://rctwg.humboldt.edu/virtual-fair>.

NTHMP PARTNER UPDATES

Northern California DisasterCon 2024

By Todd Becker, Cal OES

DisasterCon was held over two days in September 2024 in Northern California. This event was hosted by the Humboldt County Sheriff's Office of Emergency Services and the Resiliency Training and Innovation Center at Blue Lake Rancheria.

DisasterCon, formerly known as TsunamiCon, is an annual event that has previously focused primarily on tsunami specific presentations and emergency planning. This year the event was re-branded and expanded to include riverine flooding and other disasters. Expansion of the event to include other hazards was prompted because 2024 marks sixty years since Northern California experienced both devastating tsunami and riverine flooding impacts within one calendar year. Tsunami impacts were associated with the tsunami generated from the Great Alaskan Earthquake in March 1964 followed by disastrous riverine flooding in December 1964.

The event was attended by emergency managers, first responders, community members, and many local, state, and federal agency representatives with a role in hazards response. Day 1 of DisasterCon included presentations highlighting the changes between 1964 and 2024, and how the approaches to emergency management, response, and recovery from impacts from tsunami and riverine flooding events compare between then and now. Day 2 of DisasterCon included a workshop from Cal OES on State's Catastrophic Incident Planning process.

DisasterCon promoted great discussions and networking amongst the participants. The efforts of the Humboldt County Sheriff's Office of Emergency Services and the Resiliency Training and Innovation Center at Blue Lake Rancheria to host this event each year will help improve preparedness, response, and recovery for future hazards facing Northern California.



Jun Kinoshita, Cal OES Disaster Planning Unit

UNESCO-IOC Tsunami Awareness Self-Paced Course

Summary—This online, self-paced course is the first of a series of tsunami courses organized by the UNESCO-IOC Tsunami Resilience Section and its Tsunami Information Centres. The International Tsunami Information Centre, as an IOC Ocean Teacher Global Academy Specialized Training Center (OTGA STC) for tsunamis, was the lead for the development of this course. Tsunami Awareness provides a basic understanding of the tsunami phenomenon, tsunami hazards and risks, tsunami warning systems, and tsunami preparedness. Tsunami Awareness is a pre-requisite for enrolling in later UNESCO-IOC tsunami courses.

Course content: Lesson 1. Tsunami Basics; Lesson 2. Tsunami Warning Systems; Lesson 3. Tsunami Preparedness; Resources: Tsunami Glossary.

Target audience—The audience for this course includes Government decision-makers and Community leaders, Emergency management officials, Response personnel, such as Police, Fire, and First Responders, Coastal Zone managers and planners, School principals and staff, Public and Private sector, including Tourism sector, non-government organizations, Media, General Public.



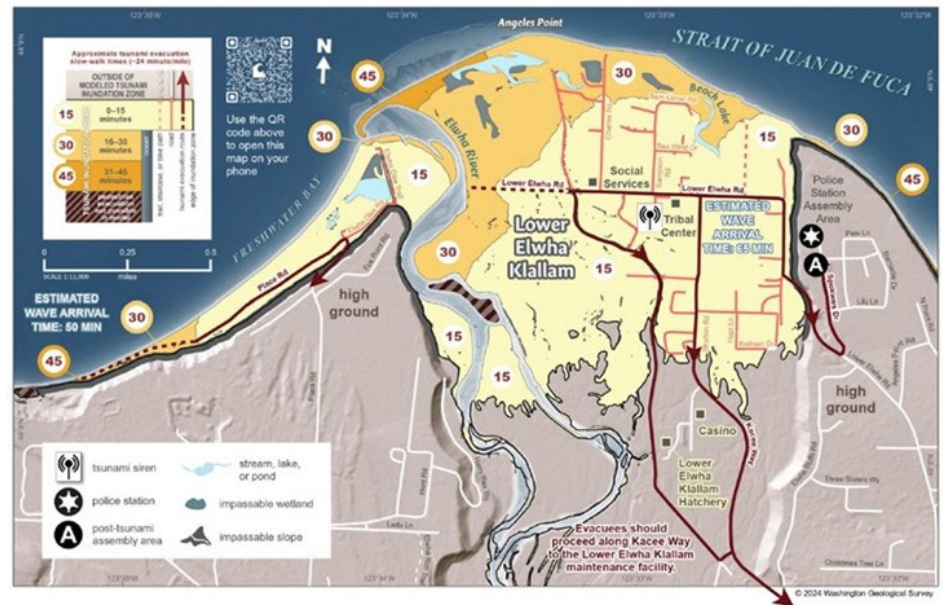
Link to training: <https://oceanexpert.org/event/4369>

NTHMP PARTNER UPDATES

Tsunami Evacuation Walk Time Maps Published in Washington State

By the Washington Geological Survey

The Washington Geological Survey has published “Tsunami Evacuation Walk Time” maps for the Makah Tribe (Neah Bay and Tsoo-Yess River), Lower Elwha Klallam Tribe (Lower Elwha), Kalaloch, and Dungeness. The maps show the amount of time it would take to evacuate from within the modeled inundation zone of a magnitude 9.0 Cascadia-sourced subduction zone earthquake. The maps show the extent of the tsunami inundation zone and the paths of tsunami evacuation routes. Colors indicate how many minutes it would take to get to safety from any given location within the inundation zone.



These maps were developed using the U.S. Geological Survey’s Pedestrian Evacuation Analyst Tool (<https://www.usgs.gov/software/pedestrian-evacuation-analyst-tool>) for ArcGIS. Emergency managers, planners, and local elected officials were heavily involved in the project providing valuable local knowledge and decision making to best serve the communities represented. The walk time maps are available for download using the following links:

- Tsoo-Yess River
https://fortress.wa.gov/dnr/geologydata/tsunami_walkmaps/ger_tsunami_walkmap_tsoo_yess_river.pdf
- Neah Bay
https://fortress.wa.gov/dnr/geologydata/tsunami_walkmaps/ger_tsunami_walkmap_neah_bay.pdf
- Lower Elwha Klallam
https://fortress.wa.gov/dnr/geologydata/tsunami_walkmaps/ger_tsunami_walkmap_lower_elwha_klallam.pdf
- Kalaloch
https://fortress.wa.gov/dnr/geologydata/tsunami_walkmaps/ger_tsunami_walkmap_kalaloch.pdf
- Dungeness
https://fortress.wa.gov/dnr/geologydata/tsunami_walkmaps/ger_tsunami_walkmap_dungeness.pdf

The maps are also available through an interactive map on our website:

<https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/tsunamis#tsunami-evacuation-maps>

The interactive map also provides access to tsunami evacuation brochures for areas that do not have walk time maps yet.

NTHMP PARTNER UPDATES

Developing the Makah Tribe's Port of Neah Bay Tsunami Maritime Response and Mitigation Strategy

By Danté DiSabatino, Washington State Emergency Management Division

After over a year of close collaboration with the Makah Tribe, Washington Geological Survey, and Washington Emergency Management, we are proud to announce the completion of the [Port of Neah Bay Tsunami Maritime Response and Mitigation Strategy](#). This strategy marks a significant milestone, not just because it is the fourth maritime strategy developed for Washington State, but because it is the first strategy created specifically for a tribal nation. The effort was the result of extensive site-specific mapping, modeling, and protective action guidance aimed at making Neah Bay's maritime infrastructure more resilient against both local and distant tsunami threats.



At the heart of this initiative was the need to identify and understand mitigation opportunities. We focused on the infrastructure in Neah Bay, looking closely at docks, cleats, pilings, and moorings. By assessing the feasibility of various mitigation actions, we were able to provide tailored recommendations to help the Makah Tribe better prepare for tsunamis generated by the Cascadia subduction zone and those originating in distant regions, such as the Alaskan Aleutian Subduction Zone. These recommendations were developed in collaboration with the community to ensure that they reflected local knowledge and needs.

Another essential aspect of this strategy was defining the roles and responsibilities during a tsunami response. Working closely with the Makah Tribe and neighboring partners, we reviewed opportunities to update and establish protocols for evacuating the waterfront, issuing protective action guidance through their local alert system, and communicating with first responders. These efforts ensure that all parties involved in the response are well-coordinated and prepared to act swiftly during tsunamis.

A Focus on Funding Opportunities for Maritime Mitigation

One of the most innovative aspects of this strategy, and what sets it apart from previous efforts, is the inclusion of a new section on funding opportunities for maritime mitigation projects. Historically, our strategies haven't delved deeply into how to fund large-scale maritime infrastructure upgrades. This time, we recognized the importance of outlining potential funding sources to help the Makah Tribe, and other communities, take meaningful action toward more resilient maritime infrastructure.

Identifying funding for tsunami mitigation isn't just about focusing on tsunami-specific programs. We explored how an all-hazards approach could open up opportunities to tap into larger funding pools that address other coastal challenges,

(Continues on page 12)

NTHMP PARTNER UPDATES

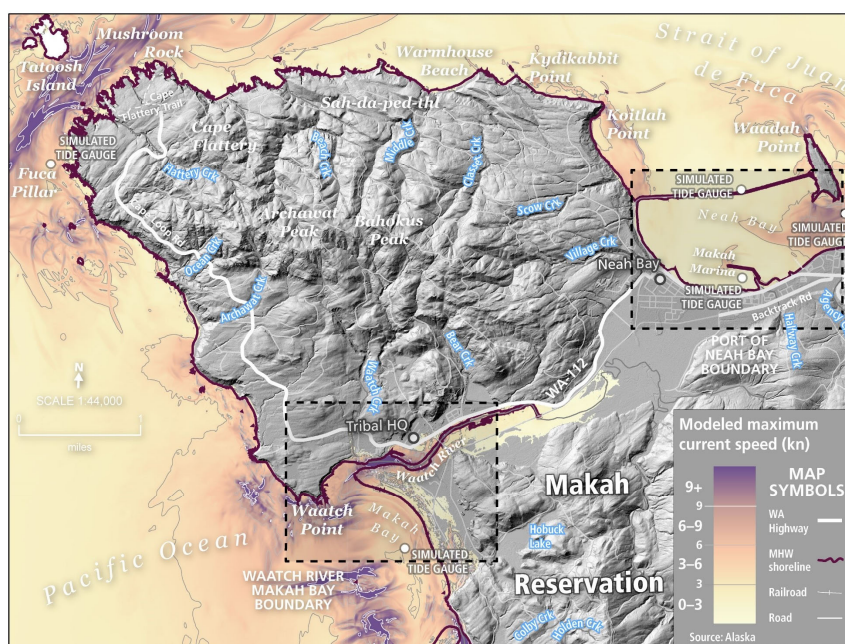
Developing the Makah Tribe's Port of Neah Bay Tsunami Maritime Response and Mitigation Strategy

By Danté DiSabatino, Washington State Emergency Management Division

(Continued from page 11)

like sea level rise, coastal erosion, and king tide storm surges. By broadening the scope, we can find ways to fund projects that strengthen communities' resilience to multiple threats.

A well-known example of available funding is FEMA's Building Resilient Infrastructure in Communities (BRIC) program. BRIC grants are essential for communities looking to enhance infrastructure resilience, and the Makah Tribe is no exception. However, this strategy goes further by identifying other sources of funding, such as the Port Infrastructure Development Program (PIDP) grants from the Maritime Administration under the U.S. Department of Transportation. Additionally, we outlined opportunities for oil spill response funding that could also overlap with tsunami mitigation efforts.



As part of this process, we supported the Makah Tribe in pursuing some of these funding options by providing letters of support. The section on funding is intended to be dynamic and evolving. As new opportunities arise, we will continue to collaborate with other states and territories through the National Tsunami Hazard Mitigation Program (NTHMP) to expand and refine this list of funding options. This approach ensures that we are not only learning from our experiences in Washington but also building a more comprehensive understanding of funding opportunities nationwide.

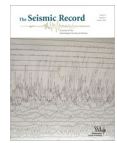
Looking Forward

The Makah Tribe's Port of Neah Bay Tsunami Maritime Response and Mitigation Strategy is a reflection of the strong partnership between the Tribe, state agencies, and county partners. It represents a step forward in both tsunami preparedness and the resilience of coastal communities. As we continue to refine and grow this strategy, we hope it will serve as a model for future projects, particularly in the area of identifying and securing funding for critical mitigation actions. Washington is committed to continuing this work through our maritime products and our role in the NTHMP, ensuring that all communities are better prepared for the next tsunami.

TSUNAMI RESEARCH & EVENTS

RESEARCH

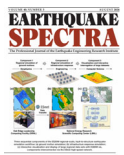
Carrillo-Ponce, Angela; Heimann, Sebastian; Petersen, G. M.; Walter, T. R.; Cesca, Simone; Dahm, Torsten, 2024, The 16 September 2023 Greenland Megatsunami: Analysis and Modeling of the Source and a Week-Long, Monochromatic Seismic Signal: *The Seismic Record*, v. 4, no. 3, p. 172–183. <https://doi.org/10.1785/0320240013>



Hughes, K. E.; Fitzsimons, S. J.; Howarth, J. D., 2024, Lacustrine mass movements in active tectonic settings: Lake tsunami sources in New Zealand's South Island: *Geomorphology*, v. 464, article 109359. <https://doi.org/10.1016/j.geomorph.2024.109359>



Imai, Kentaro; Nakai, Kentaro; Hirai, Takashi; Noda, Toshihiro; Arai, Nobuo; Iwama, Shunji; Iwase, Hiroyuki; Baba, Tohsitaka, 2024, Tsunami hazard evaluation of river embankment structures incorporating their vulnerability to seismic strong motion: *Earthquake Spectra*, v. 40, no. 3. <https://doi.org/10.1177/87552930241237815>



Petley, Dave, 2024, The 7 August 2024 Pedersen Lagoon landslide and tsunami: *Eos*, August 22, 2024. <https://eos.org/thelandslideblog/pedersen-lagoon-landslide-1>

Eos

Velasco-Reyes, E. R.; Sugawara, Daisuke; Adriano, Bruno, 2024, Tracing the sources of paleotsunamis using Bayesian frameworks: *Communications Earth & Environment*, v. 5, article 478. <https://doi.org/10.1038/s43247-024-01643-w>



Wijerante, E. M. S.; Pattiaratchi, C. B., 2024, Meteotsunamis Generated by Thunderstorms: *Journal of Geophysical Research Oceans*. <https://doi.org/10.1029/2023JC020662>



UPCOMING NTHMP & RELATED EVENTS

- ◆ November 5, 2024—World Tsunami Awareness Day
<https://tsunamiday.undrr.org/>
- ◆ November 5, 2024—PACWAVE Tsunami Exercise
<https://tsunami.ioc.unesco.org/en/node/145>
- ◆ November 7, 2024—LANTEX Tsunami Exercise
<https://tsunami.gov/?page=exercises>
- ◆ December 9-13, 2024—AGU Fall Meeting (Washington, D.C.)
<https://www.agu.org/annual-meeting>
- ◆ March 2025—CARIBE WAVE 25 Tsunami Exercise
<https://www.weather.gov/itic-car/caribewave>
- ◆ April 14-18, 2025—Seismological Society of America Meeting (Baltimore, MD)
<https://meetings.seismosoc.org/>

