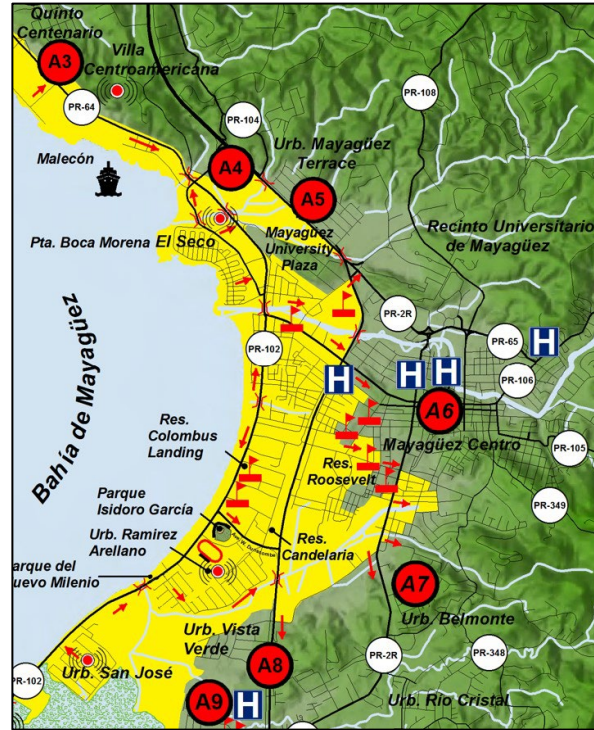




# United States National Tsunami Hazard Mitigation Program Strategic Plan for 2024 - 2029



## Message from the Chair



1. *Tsunami inundation map for Ocean Shores, Washington*
2. *Tsunami evacuation map for Mayagüez, Puerto Rico*
3. *Tsunami evacuation route sign from Cannon Beach, Oregon*
4. *The National Tsunami Warning Center in Palmer, Alaska*
5. *The nation's first tsunami vertical evacuation tower, built by the Shoalwater Bay Indian Tribe and located in Tokeland, Washington*
6. *A sign used for the NWS TsunamiReady® Program*
7. *A tsunami-evacuation painting on the road to direct people to safety in Puerto Rico*
8. *Tsunami outreach by Guam Civil Defense*



# Executive Summary

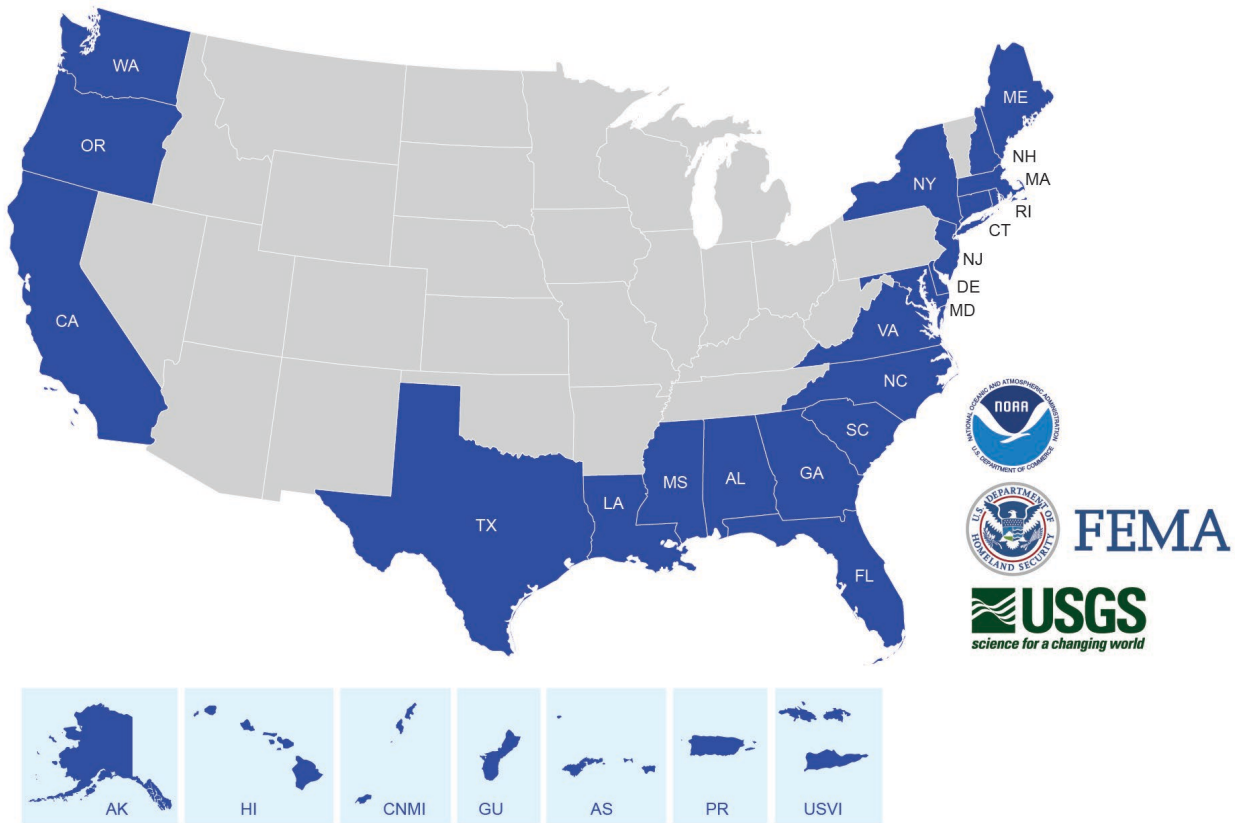
- Encourage national consistency of products
- Leverage continuing research and emerging technology
- Incorporate evidence-based approaches from social-science research
- Integrate equity into NTHMP efforts
- Recognize the potential impacts of climate change
- Promote economic development to enhance the New Blue Economy

Table 1.

Theme	Goals	Strategies
Hazard And Risk Assessment	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	
Tsunami Education and Preparedness	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>
Mitigation and Recovery	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	
Alert, Warning, and Response	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	
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	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	

# Table of Contents

## National Tsunami Hazard Mitigation Program Partners



# Background

**NTHMP Mission:**

**NTHMP Vision:**

Tōhoku tsunami (18,428 fatalities in Japan and



## Foundation

by tsunami hazards similar to the 2011 Tōhoku



Policy Context





## NTHMP Structure



### Coordinating Committee

**Mapping  
and Modeling  
Subcommittee**

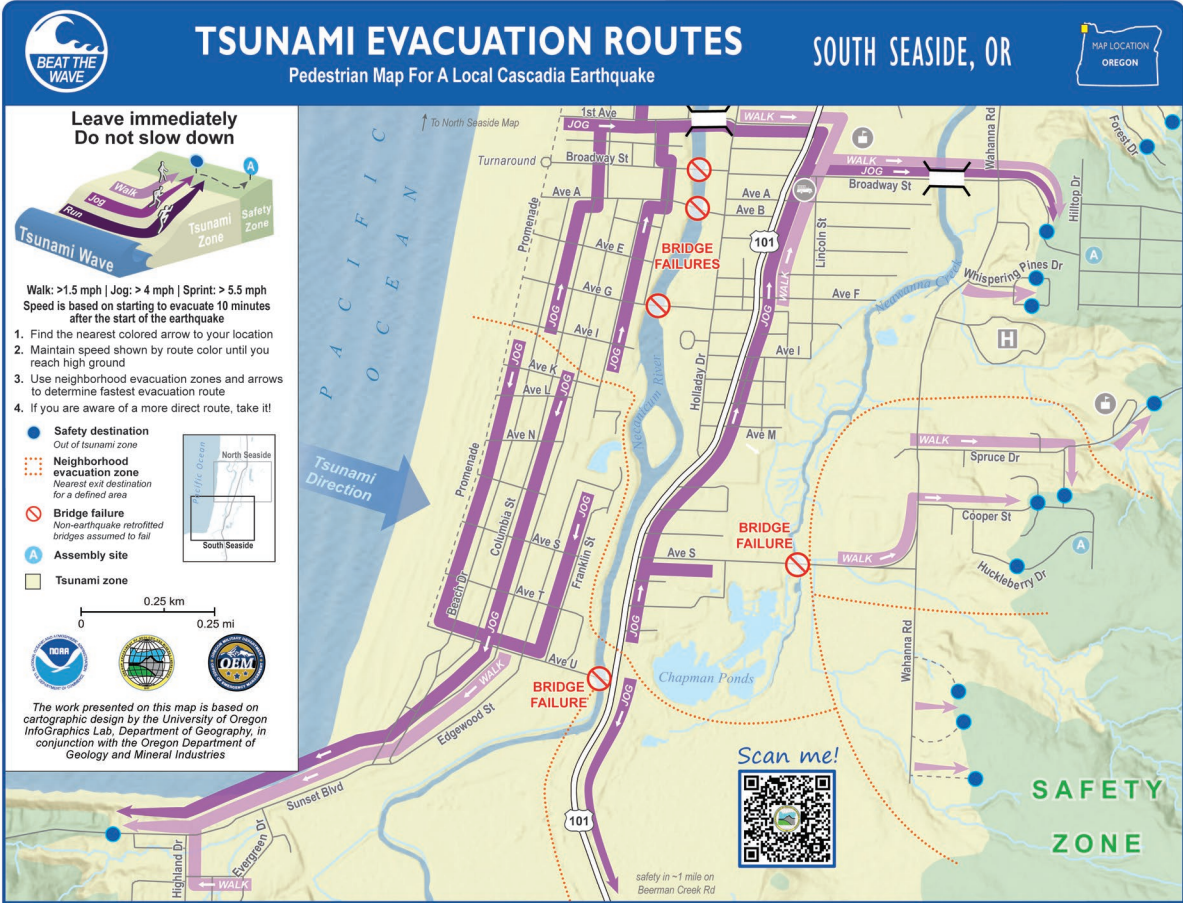
**Mitigation  
and Education  
Subcommittee**

**Warning  
Coordination  
Subcommittee**

**Mitigation and Recovery  
Planning Work Group**

**Island Caucus**

# Theme 1: Hazard and Risk Assessment



**Goal 1.1: Tsunami hazard assessments identify areas where risk-reduction planning is needed**

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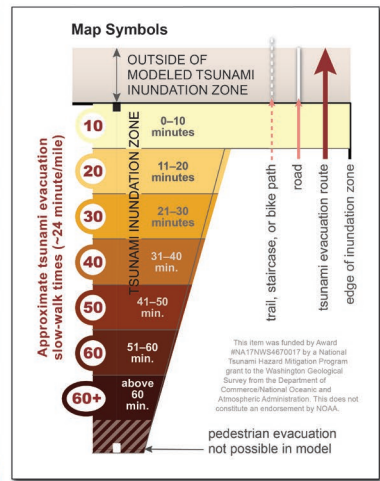
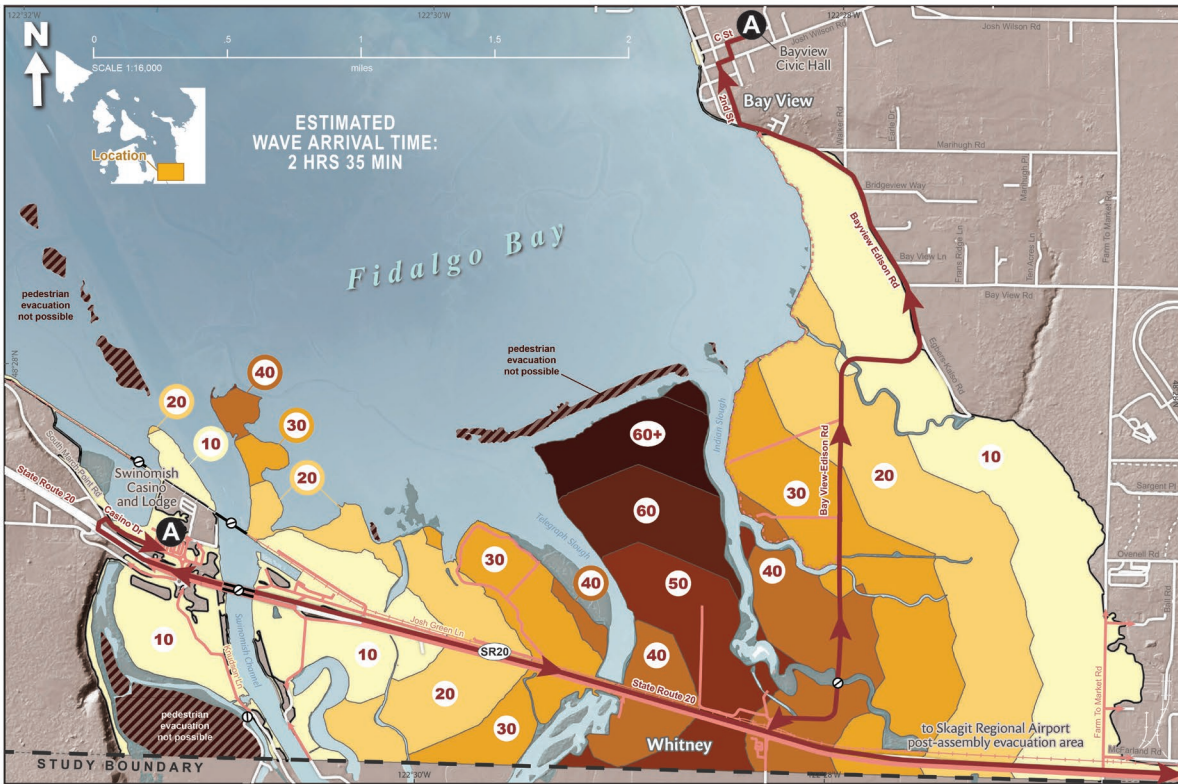
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disaster that originated in Japan



# Goal 1.2: Methods to characterize and communicate societal risks to tsunamis are developed and properly applied to support risk-reduction planning





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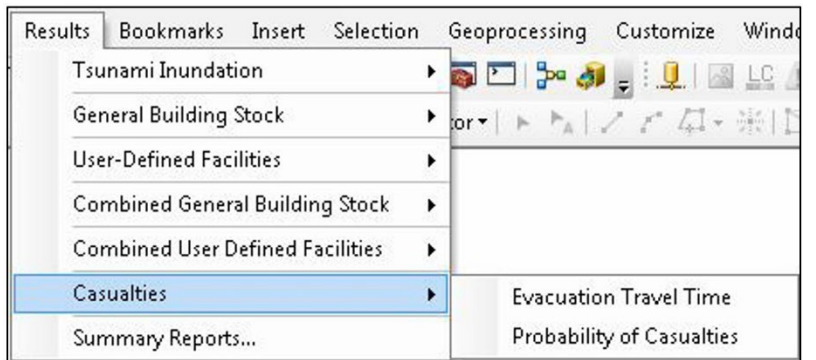
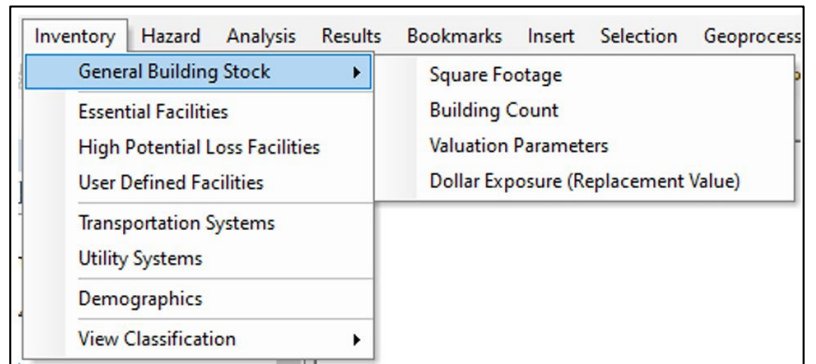
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# Hazus Tsunami Model User Guidance

Hazus 5.1

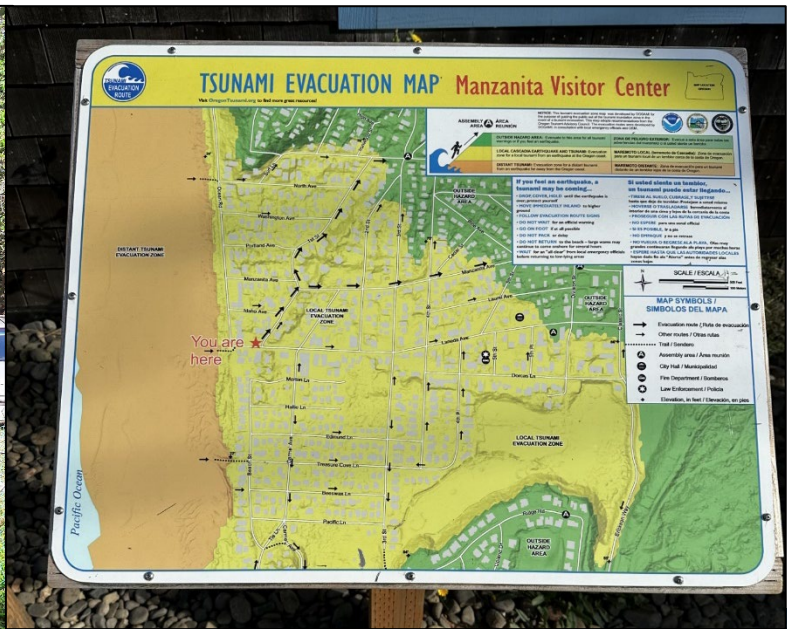
April 2022





# Theme 2: Tsunami Education and Preparedness

Japan), much emphasis has been placed on the



Goal 2.1: At-risk populations are informed and prepared to respond appropriately to tsunamis

**DROP!** **COVER!** **HOLD ON!**  
Protect Yourself During Earthquakes

**GO TO HIGH GROUND OR INLAND!**  
The Shaking is Your Tsunami Warning

**STAY THERE!**  
Tsunami Waves May Arrive for Hours

# Be *Tsunami Ready*

If you're near the coast and you feel an earthquake, **drop, cover, and hold on**, then move to high ground!

mi  [mil.wa.gov/tsunami](http://mil.wa.gov/tsunami)

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Goal 2.2: New TsunamiReady® sites established and existing locations maintained

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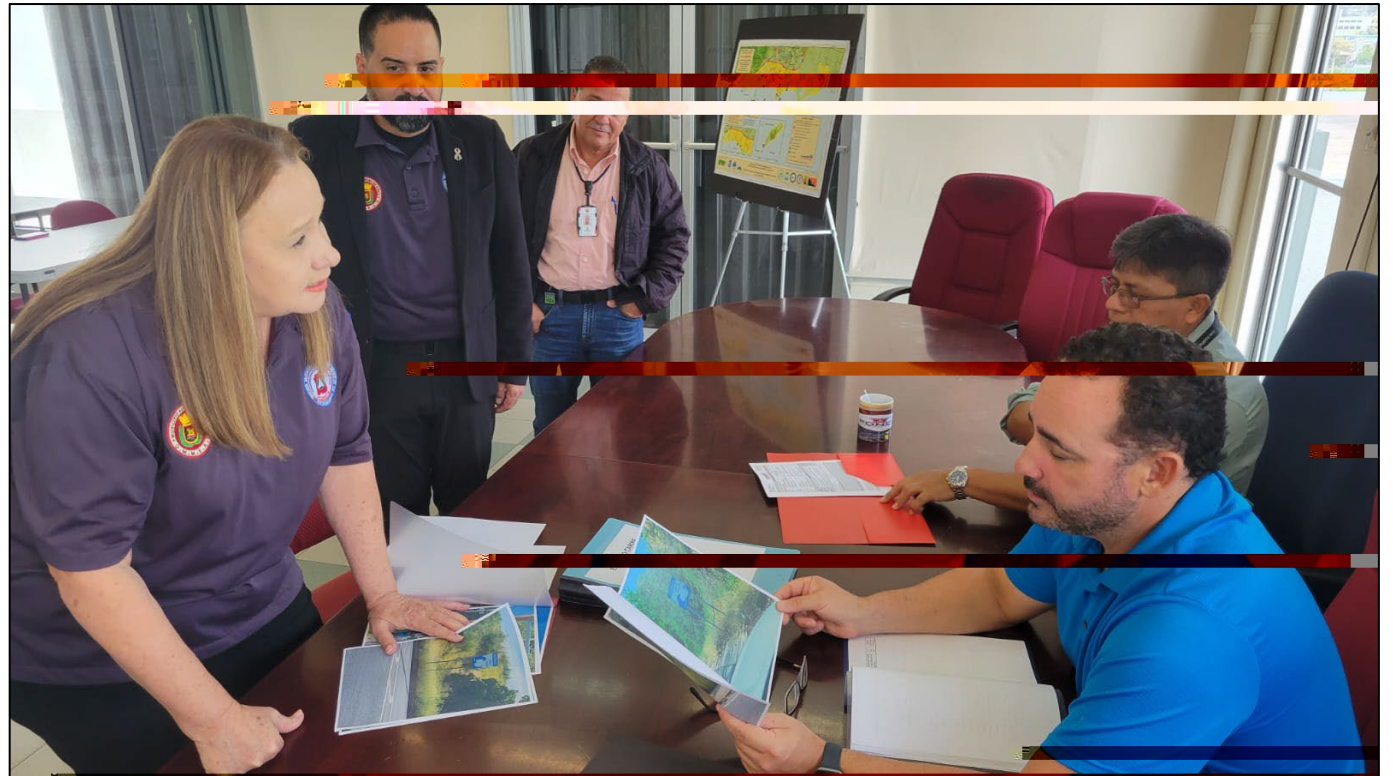
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## Goal 2.3: Local tsunami preparedness efforts are supported

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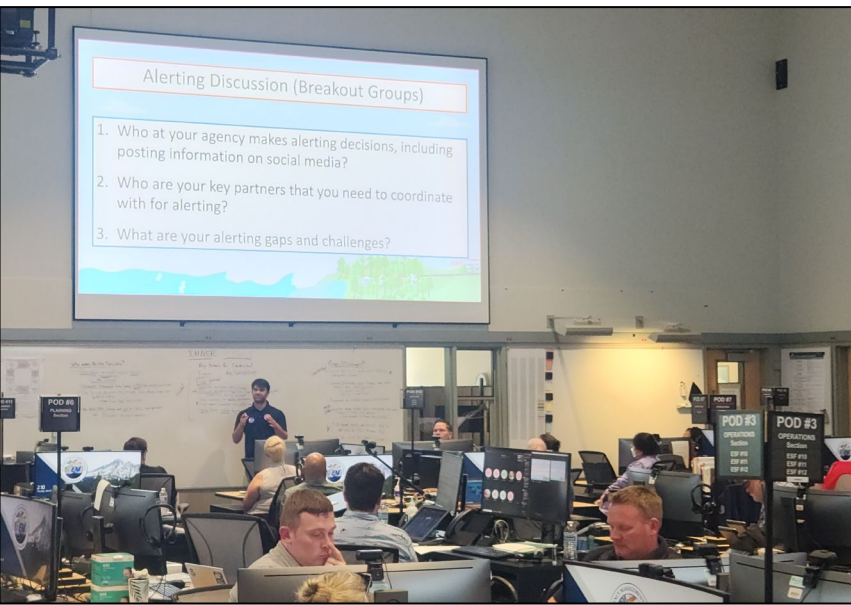
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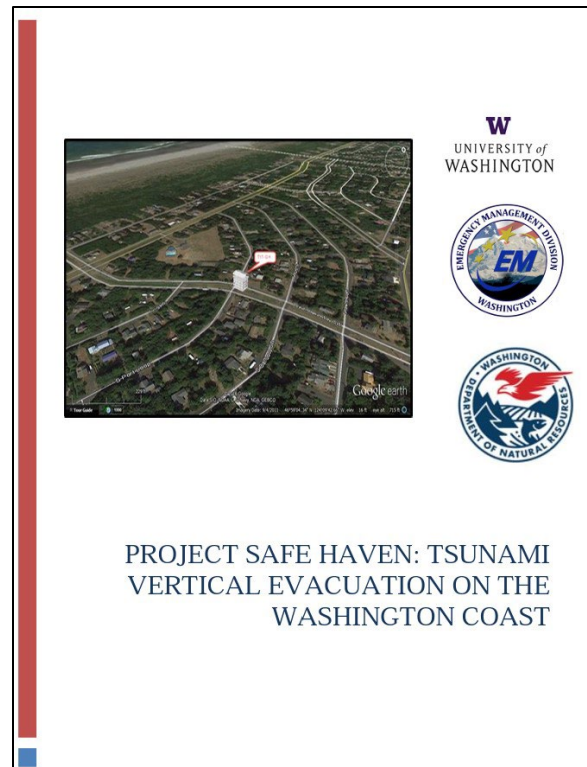
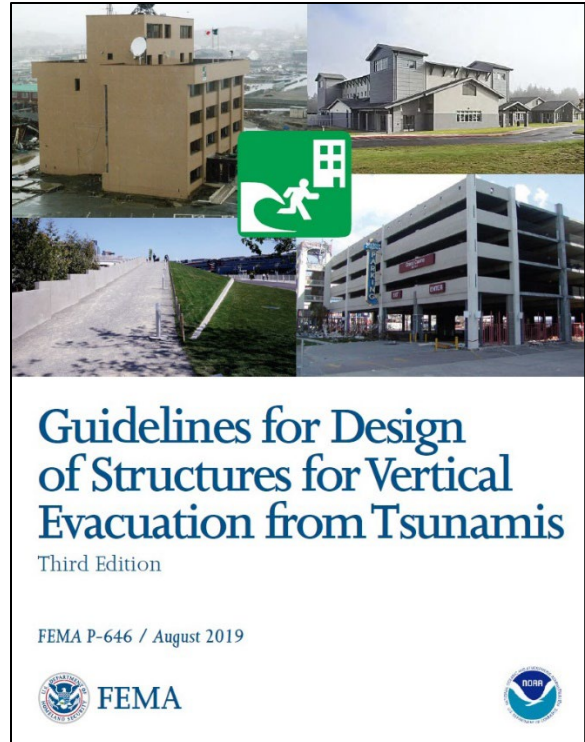
## Theme 3: Mitigation and Recovery



NOAA

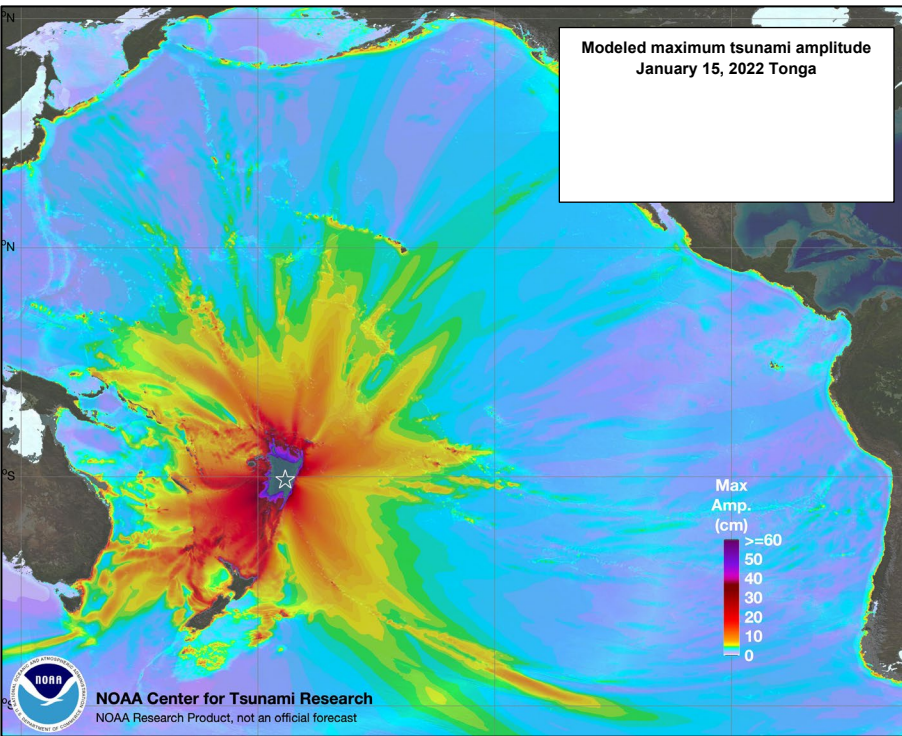


Goal 3.1: Mitigation and recovery strategies are developed for long-term community planning





from the January 15, 2022



**Goal 3.2: Mitigation and recovery strategies are initiated and incorporated into long-term community planning**

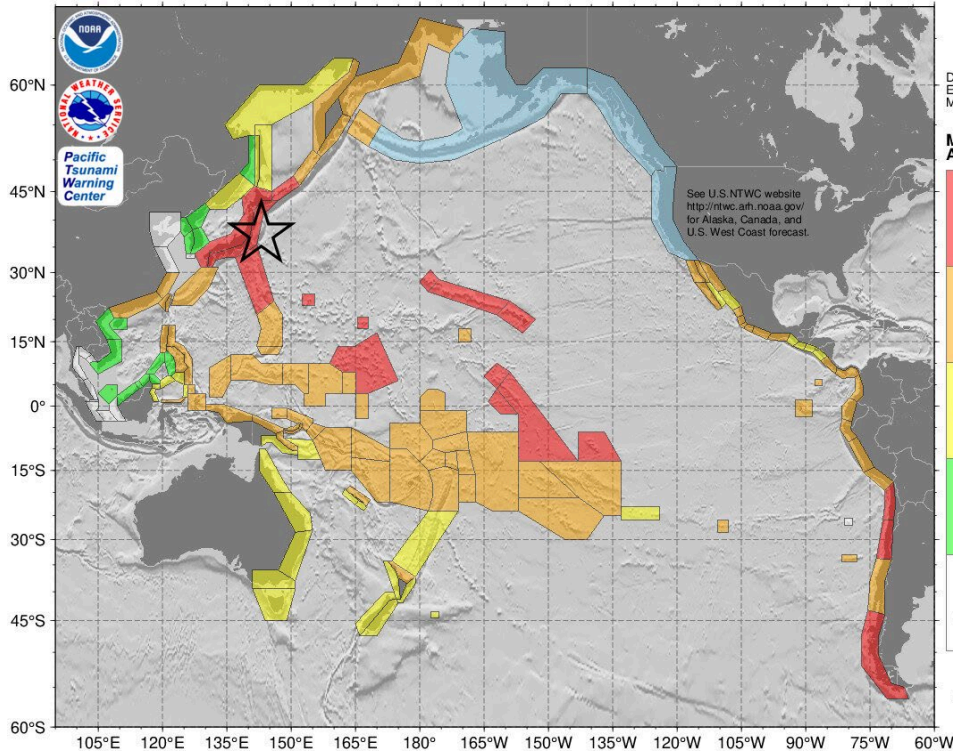
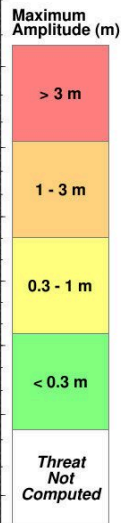


# Theme 4: Alert, Warning, and Response

## PTWC Coastal Tsunami Amplitude Forecast Polygons

Actual amplitudes at the coast may vary from forecast amplitudes due to uncertainties in the forecast and local features. In particular, maximum tsunami amplitudes on atolls and at locations with fringing or barrier reefs will likely be much smaller than the forecast indicates. This message is issued for information only in support of the UNESCO/IOC Pacific Tsunami Warning and Mitigation System and is meant for national authorities in each country of that system. National authorities will determine the appropriate level of alert for each country and may issue additional or more refined information.

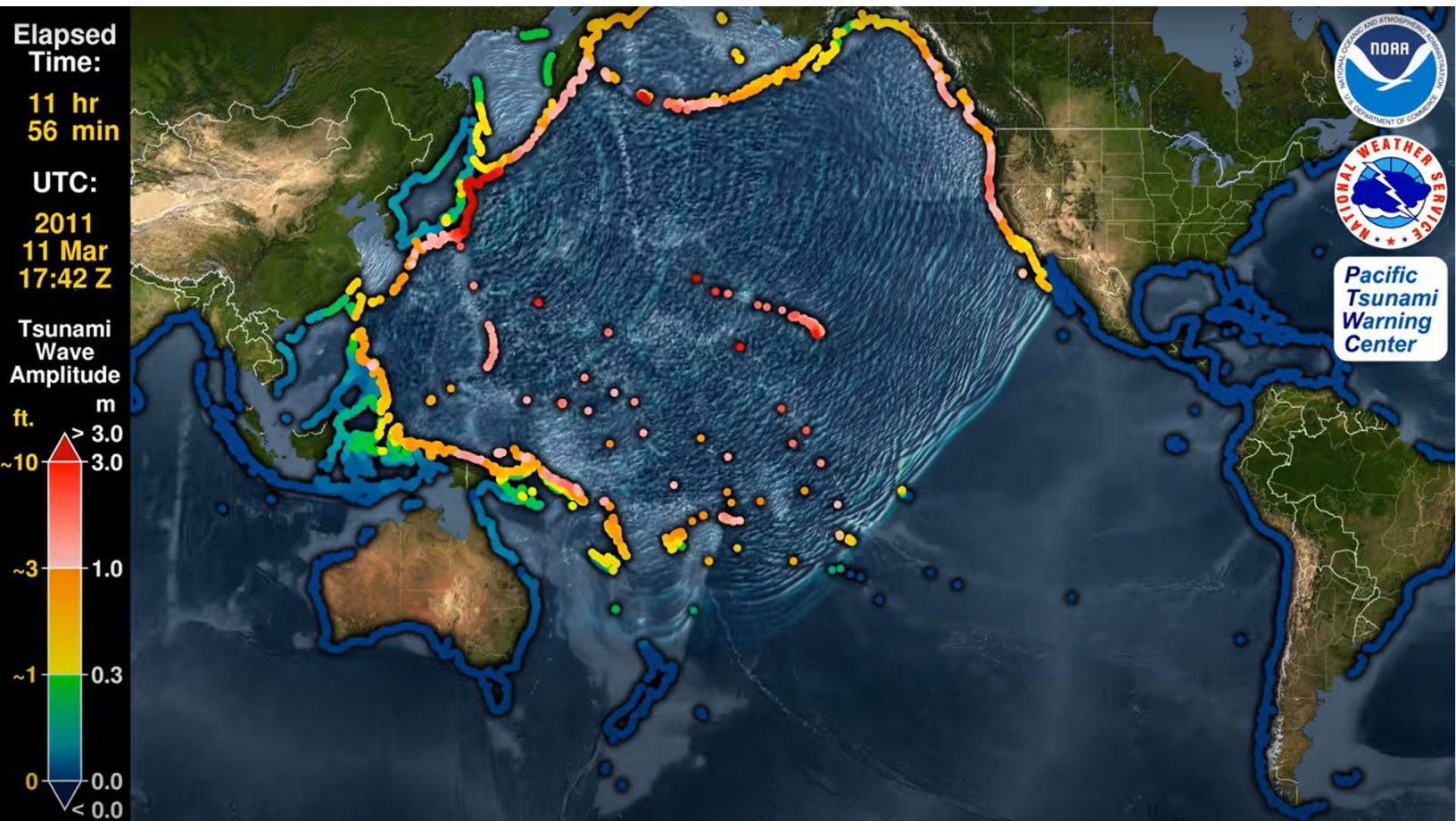
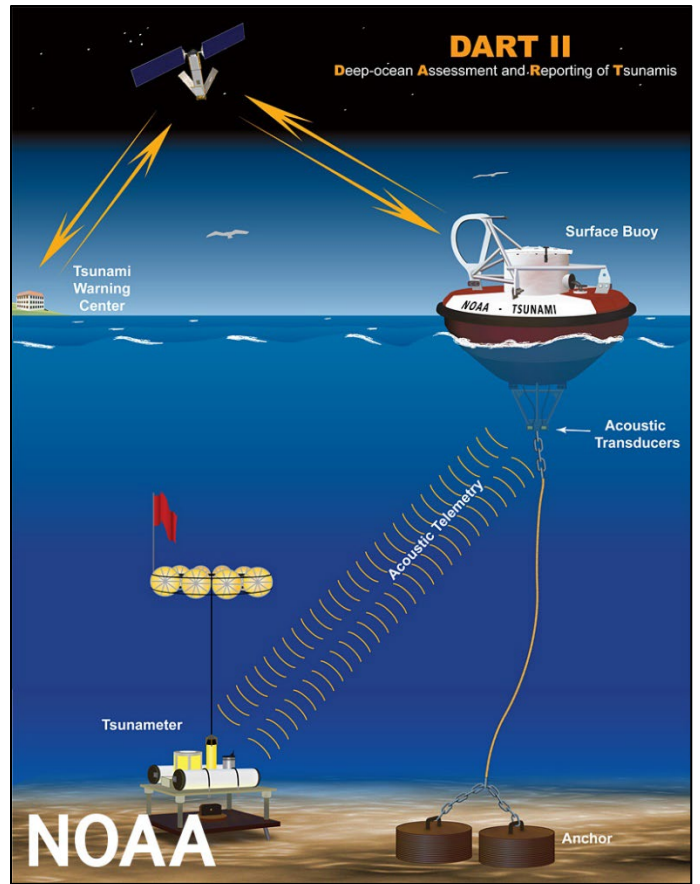
**Earthquake:**  
 07 Sep 2023  
 23:23:23 Z  
 Lat: 37.52°N  
 Lon: 143.05°E  
 Depth: 20 km  
 $M_w$ : 9.08  
 Determined Earthquake Mechanism: 



**Goal 4.1 Tsunami Warning Center products are understandable, effective, and actionable**







WEPA41 PAAQ 110851

TSUNAMI

BULLETIN

TSUNAMI MESSAGE NUMBER 4

PER PALMER AK

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER

1251 AM PST FRI MAR 11 2011

CONDITIONS HAVE CHANGED IN THIS

THE WARNING AND ADVISORY STATUS REGION  
MESSAGE

WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF OREGON FROM POINT CONCEPCION CALIFORNIA TO THE OREGON BORDER...

...THE TSUNAMI WARNING OF CALIFORNIA AND OREGON-WASHINGTON...

WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS FROM AMCHITKA PASS ALASKA/125 MILES W OF ADAK/ TO ATTU

...THE TSUNAMI WARNING OF ALASKA FROM AMCHITKA PASS ALASKA...

ADVISORY CONTINUES IN EFFECT FOR THE COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPCION CALIFORNIA...

...THE TSUNAMI ADVISORY OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPCION CALIFORNIA...

ADVISORY CONTINUES IN EFFECT FOR THE COASTAL AREAS OF BRITISH COLUMBIA AND ALASKA FROM THE OREGON BORDER TO AMCHITKA PASS ALASKA/125 MILES W OF ADAK/...

...THE TSUNAMI ADVISORY OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO AMCHITKA PASS ALASKA/...

CONDITIONS

RECOMMENDED ACTIONS

TSUNAMI GENERATED WHICH IS EXPECTED TO CAUSE DAMAGE TO D/OR ADVISORY REGIONS LISTED IN THE HEADLINE. COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO CAUSE DAMAGE TO THE WARNING AND ADVISORY REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND

OUT OF

- PERSONS IN TSUNAMI ADVISORY COASTAL AREAS SHOULD MOVE OFF THE WATER... OFF THE BEACH AND OUT OF HARBORS AND MARINAS

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

	LOCATION	LAT	LON	TIME	AMPL
7M	TOSASHIMIZU JAPAN	32.8N	132.9E	0747UTC	00.9FT/00.29M
5M	TOKAI JAPAN	33.8N	137.6E	0645UTC	00.8FT/00.24M
9M	OFUNATO JAPAN	39.0N	141.8E	0605UTC	10.8FT/03.29M
2M	HANASAKI JAPAN	43.3N	145.6E	0643UTC	09.3FT/02.83M
3M	BOSO JAPAN	34.8N	140.8E	0609UTC	02.6FT/00.79M

TIME - TIME OF MEASUREMENT  
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL. IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT. VALUES ARE GIVEN IN METERS AND FEET.

GENERATED. DEEP OCEAN SENSORS INDICATE A LARGE TSUNAMI HAS BEEN GENERATED.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE 8.0  
TIME - 2046 AKST MAR 10 2011  
- 2146 PST MAR 10 2011  
- 0546 UTC MAR 11 2011



**Goal 4.2 Forecast dissemination  
is effective and reliable**

®

**TSUNAMI WARNING COMMUNICATIONS TEST**

Del Norte, Humboldt, and Mendocino Counties

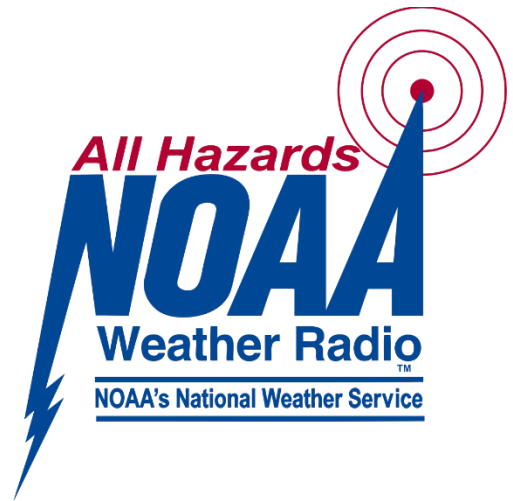
**WHEN:** Wednesday, March 29, 2023, between 11:00 a.m. and 12:00 Noon

**WHERE:** Del Norte, Humboldt, and Mendocino counties.

**HOW:** Interruptions of TV\* and Radio Stations, and activation of NOAA Weather Radios and Outdoor Sirens.

*\*Not all Cable and Satellite TV Stations may be able to participate*

**WHY:** To test the Tsunami Warning System to ensure it works properly during a real tsunami emergency.



®

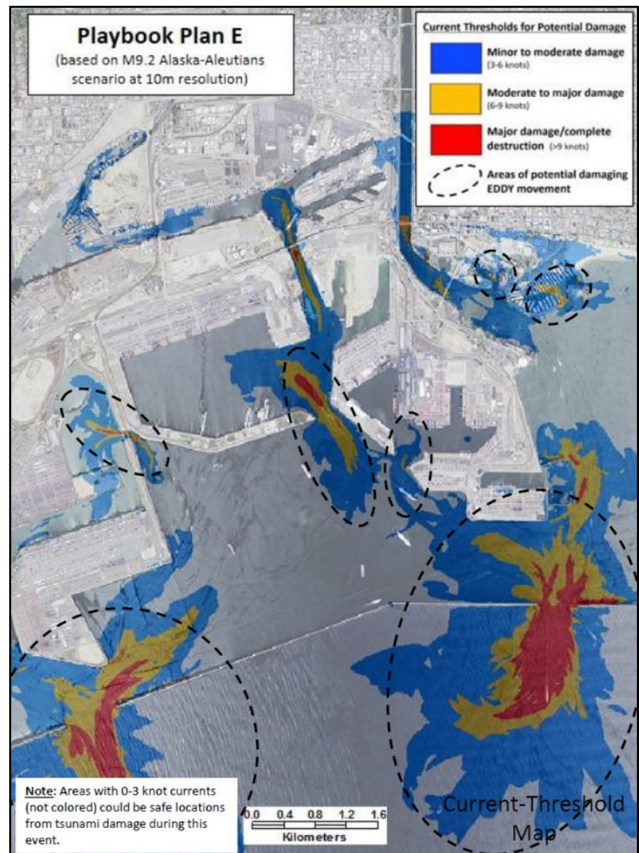


# Goal 4.3 Tsunami response is effective

**Are You in the Zone?**  
#TsunamiReady



Find Out:  
[TsunamiZone.org](http://TsunamiZone.org)



**Goal 4.4 Field data collection and communication efforts are coordinated after a tsunami**







# Implementation and Execution



# Appendix A: NTHMP Strategic Plan Work Group

**Dr. Grant Cooper**

**Corina Allen**

**Nicolas Arcos**

**Mark Benthien**

**Michael Crop**

**Edward Fratto**

**Wildaomaris González Ruiz**, Puerto Rico Emergency Management, San Juan, Puerto Rico

**Victor Huerfano Moreno**

**Kara Jacobacci**

**Jasmine Johnson-Divinity**

**David Kochevar**

**Charles McCreery**

**Elinor Lutu-McMoore**

**Christopher Moore,**

**Jason R. Patton**

**Althea Rizzo**

**Stephanie L. Ross**

**David Snider**

**Elyssa Tappero**

**Nathan Wood**

**Ian Sears**

## Appendix B: References

Goltz, J. C. Jonientz

Ross, S.L., L.M. Jones, K.M. Miller, A. Wein, R.I. Wilson, B. Bahng, A. Barberopoulou, J.C. Borrero, D.M. Brosnan, J.T. Bwarie, E.L. Geist, L.A. Johnson, S.H. Kirby, W.R. Knight, K. Long, P. Lynett, C.E. Mortensen, D.J. Nicolsky, S.C. Perry, G.S. Plumlee, C.R. Real, K. Ryan, E. Suleimani, H. Thio, V.V. and N.J. Wood. 2013. Executive summary and introduction. In *The SAFRR (Science Application for Risk Reduction) tsunami scenario*, eds. S.L. Ross and L.M. Jones. U.S.

Wilson, R.I., A.R. Admire, J.C. Borrero, L.A. Dengler, M.R. Legg, P. Lynett, K.M. Miller, A. Ritchie, K. and 2011 Japanese tsunamis in California (USA). *Pure and Applied Geophysics*

Wu, J.Y. and M.K. Lindell. 2004. Housing

*Disasters.*