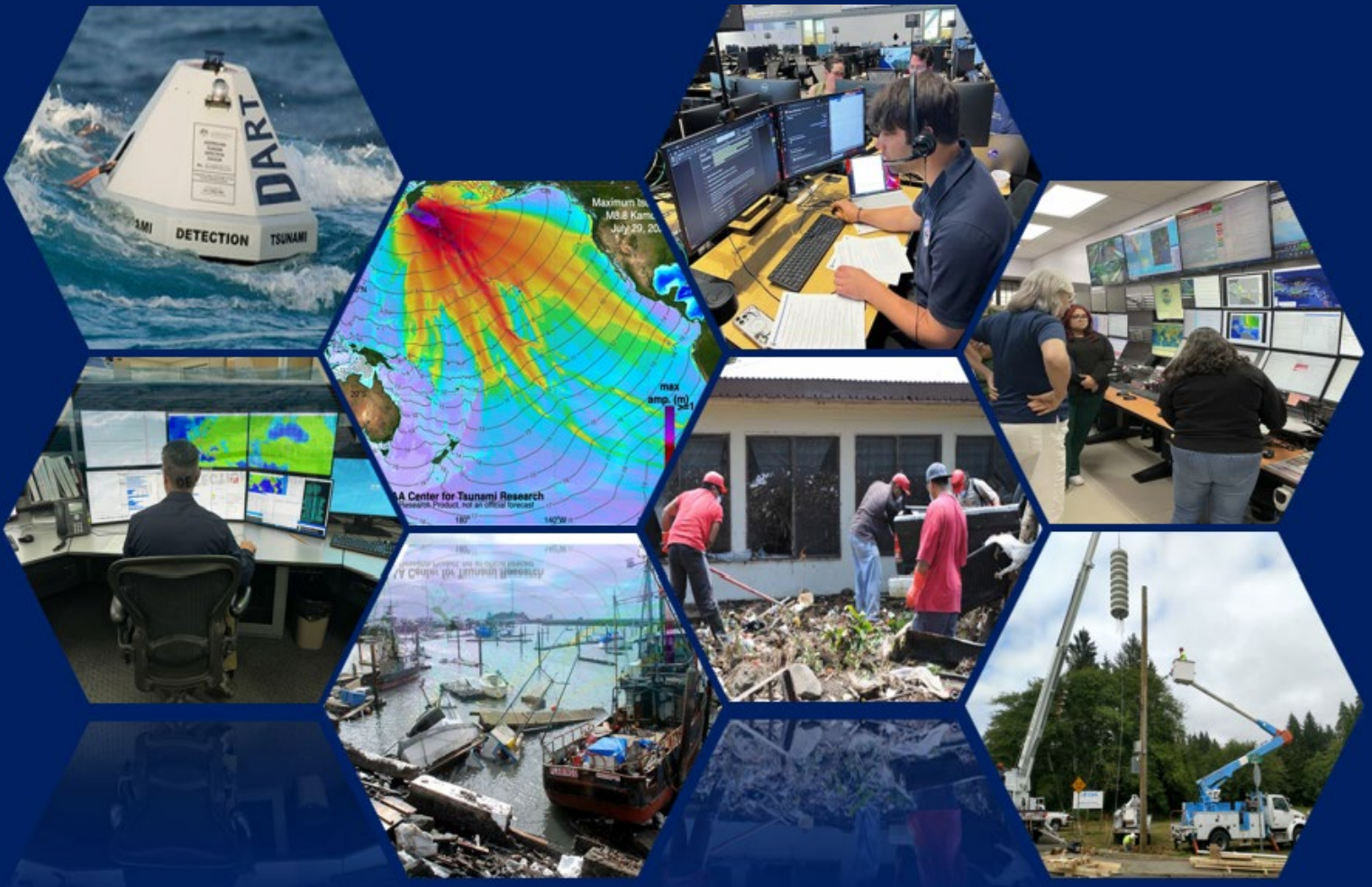


United States Tsunami Alerting Analysis

2026



Executive Summary

Since the year 2000, more than 253,000 people across the world have lost their lives to tsunamis. The 2004 Indian Ocean tsunami remains the deadliest tsunami event in recorded history; by the time the waves settled, over 227,890 people across fifteen countries had perished. This disaster highlighted the vital role of alert systems in saving lives during tsunamis. Like many natural hazards, tsunamis cannot be prevented or predicted. Coastal communities in the United States have at most hours before the first waves of a tsunami arrive - and in the most severe cases, just minutes. Millions of people living, working, and visiting tsunami hazard zones across the nation will rely on emergency alerts and protective action messaging when the next tsunami strikes our shores.

Tsunamis present a unique emergency response challenge due to their rapid onset and limited time available for decision making and alerting those at risk. Effective tsunami alerting systems are critical in mitigating loss of life. We recognize the alert levels and tsunami alerting system in the United States are not perfect. There are serious gaps and challenges in tsunami alerting that leave coastal states and territories vulnerable to tsunamis that need to be addressed. With any system or process, especially when millions of lives are at stake, we need to first understand and assess it before we can provide recommendations for improvement. The core partners of the [National Tsunami Hazard Mitigation Program](#) (NTHMP), which include Alaska, American Samoa, California, the Commonwealth of the Northern Mariana Islands, Guam, Hawaii, Oregon, Puerto Rico, the US Virgin Islands, and Washington State, have invested significant time and effort addressing these weaknesses. The product of this project is the United States Tsunami Alerting Analysis (2026).

This document represents the culmination of several years of work documenting, analyzing, and assessing tsunami alerting in the United States. This includes identifying gaps, needs, and challenges related to tsunami alerting and what resources and actions are needed to fully address these barriers. It also outlines the necessary steps needed to successfully make any changes to the current tsunami alert level system used by the Tsunami Warning Centers. Washington State initiated this project by developing standardized templates to document tsunami alerting and response processes for NTHMP core partner states and territories. We then worked with the NTHMP partners to analyze and assess these processes to identify gaps, needs, and challenges. This provided a clear picture of the current state of tsunami alerting across the nation, allowing NTHMP core partners to prioritize their needs and identify recommended potential solutions.

This document is intended to support ongoing improvements to tsunami alerting processes, procedures, and products across the United States in collaboration with key federal, tribal,

state and territory, and local governments. As outlined in the [National Weather Service \(NWS\) Priorities & Action Strategies for the Future](#), also known as “Ken’s 10” after NWS Director Ken Graham, the [NWS Tsunami Program](#) is charged with *“creating consistency and backup capabilities for the NWS’ two tsunami warning centers ... by aligning their organizational management, operations, service, and information technology and security.”* The recommendations presented in this document aim to enhance the consistency and effectiveness of tsunami alerting and response in the United States, ensuring timely and actionable alerts for all at-risk communities. The implementation strategy outlines a phased, partner-informed approach for addressing the highest priority gaps across Coverage, Capability, and Content by defining recommended actions, responsible entities, and sequencing considerations needed to improve tsunami alerting nationwide.

This effort is grounded in a shared focus on improving tsunami alerting to protect lives. The goal of this document is preparedness, not perfection. It reflects what partners know today, what systems currently support tsunami alerting, and where gaps and constraints remain. While agreement on every issue is not required, this document captures the collective understanding developed through this process and provides a practical foundation for action. As systems, funding, and capabilities evolve, these findings and recommendations can and should be revisited and refined. Our hope is this document serves as the foundation for a range of efforts at the local, regional, and national scales to strengthen tsunami alerting in the years to come.

Key Recommendations

The recommendations below are the highest priorities identified across the tsunami alerting themes of Coverage, Capability, and Content. They were selected because they address gaps with immediate life safety or operational impacts, support improvement efforts already underway, and/or are foundational needs that must be resolved before other priorities can be effectively addressed. Each section hyperlinks to the location in the document where the implementation details for these priorities are outlined in more detail.

[Coverage: High Priority](#)

- Incorporate state and territory Wireless Emergency Alerts (WEA) polygons to improve alerting coverage
- Develop a Cascadia Special Procedure Area in the Advanced Weather Interactive Processing System (AWIPS) Tsunami Operations Messaging Service (ATOMS) threat database to improve alerting coverage and capability
- Develop capability for Guam and Commonwealth of the Northern Mariana Islands (CNMI) to use WEA/Integrated Public Alert and Warning System (IPAWS)
- Develop guidance on the National Oceanic and Atmospheric Administration (NOAA) Geostationary Operational Environmental Satellites (GOES) changes to maintain Emergency Managers Weather Information Network (EMWIN) functionality
- Develop remote activation capability for tsunami siren systems
- Develop additional breakpoints to address alert coverage gaps
- Expand WEA and NOAA Weather Radio (NWR) coverage
- Improve forecasting capability for the inner coast

[Capability: High Priority](#)

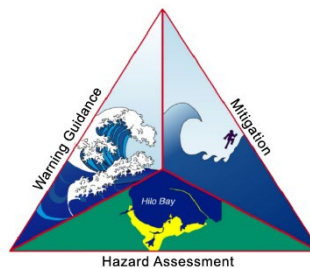
- Establish standardized siren activation procedures
- Expand duty officer training for tsunami alert decision-making
- Standardized tsunami plan training, testing, and exercises across states and territories
- Develop and maintain social media training and canned messaging for tsunami alerts

Content: High Priority

- Improve message translation capability for tsunami alerts
- Clarify or remove use of “danger still being evaluated” in tsunami messaging
- Develop operational forecast sheets to support tsunami decision-making
- Update or create distant tsunami response plans
- Provide standardized forecast information through National Tsunami Warning Center (NTWC) tsunami event data products
- Updated wave amplitude in tsunami bulletins
- Update WEA message language to improve public understanding

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Disclaimer

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