Tsunami Science and Technology Advisory Panel statement against a reduction in funding to the National Tsunami Hazard Mitigation Program

Executive Summary

The National Tsunami Hazard Mitigation Program (NTHMP) is a vital network of coastal states, territories, and regional partners that educates and prepares the public for the inevitability of tsunami impact along vulnerable US coasts. NTHMP is an integral part of NOAA's and the National Weather Service's (NWS) mission to minimize casualties, reduce property losses, and promote rapid recovery from tsunami events.

In April 2024 the TSTAP became aware that the NWS informed NTHMP partners that one-third ($2M of $6M) of FY24 grant funding was being diverted for the development of a common analytical system (CAS) for the two Tsunami Warning Centers (TWCs). The NWS indicated that this reduction in funding is set to continue into FY25 and possibly beyond.

The TSTAP recommends that the NOAA Administrator reconsider NOAA's decision to reduce support for the NTHMP and its partners in current and future fiscal years. A reduction in NWS support to the NTHMP would:

- reduce the capacity of the NTHMP to address the recommendations from the TSTAP's 2021 *Report and Recommendations Concerning Tsunami Science and Technology Issues for the United States*. In NOAA's response to the report, nearly half of the TSTAP's recommendations were referred to the NTHMP.
- reduce the capacity of NTHMP-funded partners to support NOAA's overall mission to protect people, property and critical infrastructure.
- impact long-term continuity in life and safety measures, which are especially critical during catastrophic local-source tsunamis.
- negatively impact NTHMP-led efforts in all aspects of NOAA's end-to-end tsunami program, including preparedness, education, and mitigation efforts (Table 1).

Table 1: Tsunami areas of focus identified in the *Tsunami Warning and Education Act* (TWERA) and the organizations responsible

	Research	Detection	Forecasting	Warning	Mitigation	Resiliency	Preparation
NOAA-NWS	■	■	■	■			
NTHMP State/Territory Programs	■	■	■	■	■	■	■
USGS	■	■					
FEMA					■	■	■

Perspective

The NOAA Tsunami Science and Technology Advisory Panel (TSTAP) was formed at the direction of Congress through the Tsunami Warning, Education, and Research Act (TWERA) of 2017. The mission of the TSTAP is to provide recommendations to the NOAA Administrator via the NOAA Science Advisory Board on matters regarding tsunami science, technology, and regional preparedness. TWERA requires that the TSTAP assess and make recommendations concerning seven different tsunami focus areas: tsunami research, detection, forecast, warning, mitigation, resilience, and preparation. Although NOAA and other Federal agencies have responsibilities for portions of these focus areas, for most if not all, NTHMP state and territorial partners take part in these efforts (Table 1) through the various NTHMP subcommittees and/or through required ongoing interactions with their coastal constituents (e.g., city and county officials, port and harbor officials, and the public). This continuity in planning makes the NTHMP State and Territory Programs a vital part of the end-to-end National Tsunami Program, and is essential to NOAA's overall mission to protect lives and property.

The 2021 TSTAP Quadrennial Report outlined eight overarching topical recommendations and 22 task-related sub-recommendations that addressed issues or gaps that existed at the time the report was written. Within the same 2021 Report, the TSTAP highlighted the work of the NTHMP recognizing it as a "*strong and active partnership (that) connects states (territories and regional partners) with the Federal agencies…(and) enables all levels of government to work together toward the common goals of protecting lives and reducing economic losses from tsunamis at the community level."* The importance of the NTHMP partners was further validated in the NOAA Science Advisory Board's introductory letter to the 2021 TSTAP report, which states:

> "*It should also be stressed that the Nation's ability to save more lives from local tsunamis generated by nearby subduction zone earthquakes will be due to implementation of recommendations related to improving and funding state and local preparedness, mitigation, communication, and education efforts."*

The 2021 TSTAP report recommended, and NOAA concurred in its response, that nearly half of the 22 recommendations in the 2021 Report should be addressed by or with the assistance of the NTHMP. These recommendations and other information highlighting the importance and capacity of the NTHMP partners are summarized in the attached Appendix.

As of June 2024, despite the importance of the NTHMP, this program is in a vulnerable position. First, three full-time NOAA staff members who have helped support the NOAA tsunami program and the NTHMP partners over the past five years have left their positions and are being replaced with new personnel at NOAA's National Weather Service (NWS). This loss of institutional knowledge will likely impede the ability of the NTHMP to do its work, and slow its progress.

Second, and perhaps most critically, the NWS informed the NTHMP partners that one-third ($2M of $6M) – a substantial amount – of FY24 NTHMP grant funding was being applied to begin development of a common analytical system (CAS) for the two Tsunami Warning Centers (TWCs). NOAA has referenced the 2021 TSTAP recommendations to justify applying these funds for other NWS tsunami priorities. This transfer of funds away from the NTHMP was not the intent of the TSTAP recommendations and likely creates new gaps in the end-to-end NTHMP work. In addition, proposed upgrades to the NOAA-NWS tsunami forecast and warning system will require additional support for NTHMP partners to update state, territory, and local forecast and communication procedures.

It is the opinion of the TSTAP that funding for the CAS should not come at the expense of supporting the work of the NTHMP and its partners. This action would be highly counterproductive. Reducing grant funding support for NTHMP partners could create significant problems and gaps in the end-to-end national tsunami effort (see Table 1), especially as it relates to the life safety of the public and addressing TSTAP recommendations. Given that the end-to-end tsunami warning system relies on the TWCs and the NTHMP partners, it is the hope of the TSTAP that the TWC unification effort and development of the CAS will not continue to divert funding from grant support for NTHMP efforts in the future.

We thank the members of the SAB for their attention and assistance in addressing this matter. The TSTAP will continue to closely monitor the situation to determine the severity of impacts from these actions.

Appendix

TSTAP Recommendations or topics that reference or were referred to NTHMP and TSTAP comments on these dependencies on which the NTHMP plays a role. These items are listed in chronological order from TSTAP reports and do not encompass all NTHMP dependencies or priorities.

TSTAP topic or recommendation that references NTHMP & Source*	NTHMP dependency or role	TSTAP identified consequences from reduced NTHMP support
TSTAP Quad Report recommendation 2.1: It is recommended that NOAA increase development and improve dissemination of observation networks like tide gauges, web-cameras, and real-time observer	TSTAP recommended that NOAA work with NTHMP partners to assist with locating and maintaining these coastal observation networks.	NTHMP is a critical partner in this recommendation.

programs. (Source 1)		
TSTAP Quad Report recommendation 3.1. It is recommended that NOAA improve the integration of TWC warning functions with USGS, state, and local warning needs and functions. (Source 1)	TSTAP recommended that NOAA collaborate with states (and territories) and USGS regarding tsunami warning functions, especially through Earthquake Early Warning and Wireless Emergency Alert platforms.	NTHMP is a critical partner in this recommendation.
TSTAP Quad Report recommendation 3.2. Improve tsunami message composition and dissemination methods including updating the tsunami.gov website, creating a single domestic bulletin, and early messaging before a tsunami forecast is developed. (Source 1)	TSTAP recommended that NOAA coordinate with NTHMP partners to make improvements to the tsunami.gov website and tsunami alert messages, and work to make forecast information and products available in a more timely manner for emergency managers and the public.	NTHMP is a critical partner in this recommendation.
TSTAP Quad Report recommendation 3.3: It is recommended that the NOAA Administrator make available foundational forecast data from propagation models and inundation model results to constituents. (Source 1)	Referred by NOAA to NTHMP Warning Coordination Subcommittee (WCS)	The WCS has stated they do not have the capability to do this. Ineffective referral.
TSTAP Quad Report recommendation 4.1: It is recommended that the NOAA Administrator expand granularity in tsunami alert regions where complicated waterways and large bays exist (e.g., Puget Sound, San Francisco Bay) (Source 1)	Referred by NOAA to NTHMP WCS “This will be considered through the NTHMP WCS in CY23.”	The WCS has stated they do not have the capacity to do this. Ineffective referral.

TSTAP Quad Report recommendation 4.2: It is recommended that the NOAA Administrator update special procedure areas, threat database thresholds, breakpoints, and forecast point locations. (Source 1 & 4)	Referred by NOAA to NTHMP WCS “This will be considered through the NTHMP WCS in CY23.”	The WCS has stated they do not have the capacity to do this. Ineffective referral.
TSTAP Quad Report recommendation 5.1: It is recommended that the NOAA Administrator develop a standardized framework for characterizing, selecting, and using consistent tsunami sources between states. (Source 1)	Referred by NOAA to NTHMP Mapping & Modeling Subcommittee (MMS). *NTHMP member states and territories are responsible for developing tsunami emergency response plans to include expected inundation lines and evacuation maps.*	The MMS has stated they do not have the capacity to do this. Ineffective referral. While NTHMP members have this responsibility, with no additional funding or direct delivery by NOAA, it is less likely this recommendation will be met or delivered.
TSTAP Quad Report recommendation 5.2: It is recommended that the NOAA Administrator improve guidelines for evacuation maps that ensures consistency between states/communities and develop a national online repository. (Source 1)	Referred by NOAA to NTHMP Mapping & Modeling Subcommittee (MMS).	The MMS has stated they do not have the capacity to do this. Ineffective referral.
TSTAP Quad Report recommendation 5.3: It is recommended that the NOAA Administrator prioritize probabilistic tsunami hazard mapping at a national scale, especially for updating ASCE/Building Code “Tsunami Design Zone” maps. (Source 1)	“NOAA will raise this issue within the appropriate NTHMP subcommittees”	No NTHMP subcommittee has the capacity to do this nationally. Some states and territories are completing this locally.

TSTAP Quad Report recommendation 6.1. Develop guidance and products for tsunami mitigation/recovery consistent with and leveraging climate change adaptation strategies. (Source 1)	TSTAP recommended that NOAA collaborate with NTHMP partners to explore leveraging tsunami with climate change adaptation strategies and funding efforts so mitigation and recovery activities take on a more multi-hazard approach.	Reducing support to the NTHMP partners will limit the capability to assist NOAA with this.
TSTAP Quad Report recommendation 6.2: It is recommended that the NOAA Administrator conduct evacuation modeling, feasibility studies, and risk analyses for vertical evacuation structures. (Source 1)	"NOAA will work with NTHMP Partners and other government and industry experts, as resources allow, to explore establishing common standards. NOAA will also encourage states to consider incorporating vertical evacuation studies in their NTHMP grant proposals."	No evidence of action by NOAA or state/territory partners collectively. No visibility on what states have requested or have received grant funding for since 2019 (in violation of Federal Law.)
TSTAP Quad Report recommendation 7.1: It is recommended that the NOAA Administrator improve tsunami modeling capabilities in the following conditions/ areas: variable landscapes (i.e., surface roughness), heavy vegetation, built environment, and dynamic river systems. (Source 1)	NOAA will look for opportunities to partner with NTHMP member states and territories to advance this scale of modeling capability as resources permit.	No evidence of action by NOAA or state/territory partners collectively.
NTHMP Subcommittee actions described in (Source 5) 2023 TSTAP SAB Update Report	NTHMP subcommittees recognize roles to carry out activities and are willing to work on them.	Even though NTHMP subcommittees are willing and interested in working on activities, there is no evidence of action on any of them. In April 2024, NTHMP representatives stated that without additional resources (funding), actions will not occur.

Tsunami Advisory tsunami-specific social science study (Source 2)	Socializing and norming any potential change to this Advisory level term depends on full engagement with NTHMP partners	State and local stakeholders have the most at stake on any change to this term. Many years of grant-funded signage and education have been developed and delivered about this term. Estimated resource requirements to make any term change will exceed $10M over 3 years just for NTHMP partners.
TsunamiReady “false sense of Security” requires a social science study (Source 2) TsunamiReady renewals may require review in cooperation with respective state or territory partners (Source 2)	As provided in NWS Directive 10-704: 1) NTHMP partners may advise recommendations or changes to NWS TsunamiReady Guidelines; 2) NTHMP partners should develop robust and effective State or Territory TsunamiReady Board.	1. It is essential that NTHMP partners participate in developing, reviewing, and field testing updates to NWS TsunamiReady Guidelines. 2. For an unknown reason, no state or territory other than Puerto Rico has a State TsunamiReady Board, so that leaves the NWS in the exclusive decision-making space on recognition and renewal of TsunamiReady communities.
FEMA’s National Risk Assessment treatment of tsunami hazards has resulted in an inconsistent, simplistic, and lower estimation of the tsunami risk across the country relative to other hazards. (Source 3)	Lacks quality state-specific and historical tsunami data	Requires coordination and developing better tsunami-related datasets to provide to FEMA to update its NRI to be more accurate.

*Sources:

1. 2021 TSTAP Quadrennial Report and NOAA’s Response Report (April 2022)
2. 2022 Annual TSTAP SAB Update Report and transmittal letter (February 2022)
3. TSTAP National Risk Index statement (August 2023)

4. White Paper on Prioritizing Upgrades to Tsunami Forecast Capabilities to Protect Public Safety in Large Coastal Population Centers and Complicated Waterways (October 2023)
5. 2023 Annual TSTAP SAB Update Report and transmittal letter (April 2023)