



# SCIENCE ADVISORY BOARD

6 January 2022

Dr. Richard W. Spinrad  
Under Secretary of Commerce for Oceans and  
Atmosphere & NOAA Administrator  
Herbert C. Hoover Building, Room 6811  
14th Street & Constitution Avenue, NW  
Washington, DC 20230

Dear Dr. Spinrad:

***Subject: Transmittal of the SAB Tsunami Science and Technology Advisory Panel First Quadrennial Report to Congress***

On behalf of the NOAA Science Advisory Board (SAB), I am pleased to transmit to you the first quadrennial report from the Tsunami Science and Technology Advisory Panel (TSTAP), *Report and Recommendations to the NOAA Science Advisory Board concerning Tsunami Science and Technology Issues for the United States*. In the Weather Research and Forecasting Innovation Act (WRFIA or the Weather Act) of 2017, the SAB was tasked to establish a working group on tsunami science and technology under an existing SAB working group. In response, the SAB created the TSTAP under the Environmental Information Services Working Group (EISWG, itself authorized under the Weather Act). This panel was requested to deliver a report to Congress not less than every four years.

In its first report, the TSTAP provides eight overarching recommendations, each of which include one or more priority actions. The recommendations generally in priority order are:

1. Improve unification and capabilities of the Tsunami Forecast System
2. Improve tsunami detection and observation systems
3. Provide more extensive, consistent, and accurate tsunami messages and products
4. Develop enhancements to Tsunami Warning Center forecasts and alert systems
5. Improve consistency in tsunami preparedness and mitigation products for communities
6. Produce guidance for improving long-term community resilience to tsunami hazards
7. Improve tsunami hydrodynamic modeling
8. Develop tsunami research priorities and leverage research opportunities

As a result of reviewing this report, the SAB emphasizes urgency of the situation with the two Tsunami Warning Centers (Pacific TWC in Hawaii and National TWC in Alaska). The two TWCs operate independently, although they are meant to support each other and serve as back-ups in the event one of the centers is not operational. We draw your attention to a section of the report immediately following

the Introduction called Urgent Need for Action, which states: *“The most significant recommendations from the TSTAP involve improvements to the NOAA NWS Tsunami Warning System and its two Tsunami Warning Centers (TWCs).”* The TSTAP notes that National TWC and Pacific TWC currently have independent technology and standard operating procedures, with certain parameters not unified between the TWCs. This current operational posture (i.e., independently operating and managed TWCs) introduces significant risk of analytic inconsistency and operational lag between the TWCs, which can contribute to confusion between customers supported by the individual TWCs. A result of independent operations means that the one TWC cannot fully and seamlessly serve as a replacement for the other if one goes off-line. Further, there are inconsistencies in tsunami forecast information provided by the TWCs, and no regular exercises are performed to test back-up capabilities. By operating the Tsunami Warning System as two independent regionalized components, instead of as a single national capability, the NWS introduces and accepts the risk of systemic inconsistency in warning products and resulting response when a tsunami event occurs. While this is not a "single point of failure," as there is latent back up capacity, it is rather a "failover failure," a symptom of not being unified. This situation raises grave concerns on the part of the SAB.

The TSTAP notes in its Executive Summary, *“It is not a matter of if, but when the next tsunami will strike the U.S. coastline. The TSTAP sees an urgent need for action to ensure our nation is doing more to mitigate this risk and also doing everything possible to prepare and equip the end-to-end tsunami program with the tools and staff necessary to detect, forecast, and alert the public in a clear and timely fashion.”* The SAB wishes to draw your attention to this paragraph.

The SAB further points out the section called Population at Risk, which notes *“population density along U.S. Coastlines continues to increase. This has a major impact on public tsunami exposure and risk. While precise data for at-risk populations are not available, it is estimated that hundreds of thousands of residents and employees as well as millions of visitors are located within tsunami-prone areas along the coastal regions of the U.S. each year (Dr. Nate Wood, USGS; personal communications).”* In addition, *“The existing and likely increasing coastal population elevates the actions and activities recommended in this document to an urgent level.”*

It has come to the SAB's attention from the report and follow up meetings with TSTAP members and other experts that, if the recommendations provided are not addressed, hundreds of thousands of people on the west coast could be at risk of confusion and even potential injury and death. This risk is extended to other parts of the U.S. from other local tsunami sources, such as in Alaska, American Samoa, and Puerto Rico. 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. Recommendation #3 further highlights the significant need to improve integration of TWC warning functions with USGS, state, and local warning needs and functions. This collaboration is critical for effective warnings.

The proffered recommendations to improve NOAA TWC operations are important and will help to minimize impacts to economic assets, the maritime community, and the quality of life of coastal communities, given the typically short time frames (hours) before wave arrival typically available for distant tsunamis.

The SAB greatly appreciates the opportunity to provide this advice to both Congress and NOAA. Because Congress requested this report, we ask that NOAA transmit this report to the appropriate Congressional committees as soon as possible. We look forward to engagement with NOAA on this topic in the coming years.

Very Respectfully,

A handwritten signature in blue ink that reads "John R. Kreider". The signature is fluid and cursive, with the first name being the most prominent.

John R. Kreider  
SAB Chair

Cc: Karen Hyun  
Michael Weiss  
Craig McLean  
Mary Erickson  
Andrea Bleistein  
Mike Angove  
Emma Kelley  
Cynthia Decker  
Rocky Lopes  
Rick Wilson  
Courtney Edwards  
Andrew Peck

Attachment: Report and Recommendations Concerning Tsunami Science and Technology Issues for the United States