2013 - 2017 NTHMP Strategic Plan Outputs and strategic activities to meet these outputs:

A. GENERAL

Outcome: Successful Execution of NTHMP Tsunami Mapping, Modeling, Mitigation, Planning and Education Efforts

Strategies:

* Establish an accessible web-based repository for NTHMP-related products
* Strengthen Subcommittees to execute this strategic plan
* An assessment to determine the number of the tsunami threatened communities in the U.S. will be conducted.
* Advocate tsunami research as applicable to NTHMP
* Conduct periodic external review of the NTHMP

B. MAPPING and MODELING OUTCOMES and STRATEGIES

Outcome: Tsunami Inundation Maps that Support Informed Decision Making in Tsunami-Threatened Communities

Tsunami inundation maps provide information necessary to create evacuation maps. Where potential maximum sources and coastal bathymetry/elevation are known, maps can be created by modeling expected inundation using one of many numerical techniques. To accurately represent actual inundation through a model, high resolution bathymetric and elevation data are necessary. Where either the source or bathymetric /elevation data are not well known, other techniques can be used to estimate maximum inundation. As the Program extends to areas with less defined sources and poorer bathymetric control, these other techniques must be used.

Strategies:

* Develop approval procedures for tsunami inundation models to meet NOAA modeling standards.
* MMS establish a benchmarking procedure based on the standards.
* Develop guidelines for tsunami inundation maps.
* Modeling efforts supported by the NTHMP to follow the same basic guidelines when creating inundation maps.
* Common output formats will enable the NTHMP to set up a web-based repository for all community inundation maps that is easily accessible by the public.
* Common use of legends and symbols will support easier map comprehension.
* Bathymetric/elevation data resolution guidelines should be set and consistent tsunami sources used as appropriate between neighboring states.
* Best practices developed by state efforts should be shared through annual modeler meetings.
* Prioritize inundation map development.
* Each NTHMP partner must determine which of its coastal communities requires an inundation map.
* Those which do not have maps completed must be prioritized.
* DEMs will need to be prioritized and created through actions of the MMS.
* Develop inundation maps for all communities with high tsunami hazard.
* Based on the NOAA/USGS National Tsunami Hazards Assessment (Dunbar and Weaver, 2007), U.S. regions are characterized by tsunami hazard ranked from very low to very high. Inundation maps should be developed for all threatened communities in regions with tsunami hazard ranked high or very high.
* Provide guidance to regions for which no inundation maps exist concerning tsunami threatened areas.
* New techniques must be developed to provide appropriate guidance to these communities.
* Ensure any NTHMP funded model code is shared.

C. MITIGATION and EDUCATION OUTCOMES and STRATEGIES

Mitigation and Education refer to the activities through which the agencies and people in the potentially impacted zone are educated and take the appropriate actions to save lives and minimize property loss. It is important to assure the integration of the ongoing hazard warning and risk management activities, emergency response plans and mitigation programs in affected areas. Since the program was created, the NTHMP has funded state and multi-state projects to improve tsunami awareness and mitigation, and the TsunamiReady program was established. In the wake of the 2004 Indian Ocean Tsunami and the following assessments of the US Tsunami Program, much emphasis has been placed on the importance of educating the public, preparing for evacuation and emergency response, and modifying land use planning and development approval practices. Even small efforts to plan for tsunamis can significantly increase community safety.

Outcome: Reduction of Loss of Life and Property Damage from Tsunamis

Tsunamis are infrequent events, but their impacts on coastal communities can be devastating. To reduce the loss of life and property, communities need to prepare for evacuation and emergency response and also modify their land use planning and development approval practices. Given the challenge to maintain mitigation and preparedness programs when the threat is perceived as remote, it is important that the measures adopted be integrated into existing community plans and that they be reviewed and revised regularly. NTHMP will provide support for periodic exercises and educational material development and distribution.

Strategies:

* Develop guidelines for mitigation, preparedness and education programs
* Educational guidelines will be developed to ensure quality educational programs are delivered by the NTHMP.
* Educational guidelines will consist of items such as: education of the teacher, curriculum content, frequency of offerings, and testing/follow-up procedures.
* Consideration will be given to the fact that many tsunami threatened regions receive visitors from other areas.
* The NTHMP definitions of “mitigation” and “preparedness” will be established.
* The NTHMP will define the term critical facilities for its program.
* A baseline of tsunami-threatened communities and critical facilities with such plans need to be increased.
* NTHMP proposes to increase the number of tsunami threatened communities which include tsunamis in their hazard mitigation plan. To measure this increase, the baseline of communities which include tsunamis in their hazard mitigation plan a baseline has to be established.
* Promote the integration of tsunami inundation research into building codes and land use planning.
* Given the advances in tsunami research, discussions need to be held with building officials to integrating tsunami resistant design; this will be done at both the ICBO and the local level.
* NTHMP partners will seek ways to incorporate tsunami loss-prevention measures to help make communities less vulnerable in the future.
* Support coordination of NTHMP mitigation programs with other state, local and federal mitigation programs.
* To maximize resources, an inventory will be prepared by each NTHMP state and federal partner mitigation activities.

Outcome: A Culture of Tsunami Preparedness and Response

Strategies:

* Facilitate educational events.
* A national education plan will be developed which will focus and provide guidance to the NTHMP education program.
* Explore the feasibility of integrating tsunamis more into K-12 education.
* Tsunami preparedness should be mainstreamed into educational curricula in zones that are at risk.
* Promote development of tsunami emergency response procedures including collaboration among federal, state, and local agencies.
* In the wake of a tsunami, emergency management personnel must be ready to respond in many different localities. These response efforts will be coordinated between national, regional and local governments through close cooperation with security officers, Coast Guard, medical personnel and engineers. Cooperation of the general public is also critical for proper tsunami response. Response procedures must be tested for their appropriateness.
* Response procedures will include rapid and safe evacuation of people at risk, establishment of evacuation routes, evacuation areas, dissemination of information, and attention for people with special needs and visitors.
* The response procedures need to address both local earthquake and tsunami events, as well as regional and distant tsunamis.
* Clear procedures will be developed for evacuation, holding and returning to the at-risk areas once the danger has passed.
* The characteristics of the population at risk [must] be identified.
* The NTHMP will promote annual table top exercises and drills which will ensure smoother and more effective operations in the case of an event.
* Support tsunami outreach efforts to coastal residents, media, coastal businesses, and tourism.
* The number of state media toolkits will increase and a national tsunami media toolkit will also be developed.
* The national tsunami media kit will be designed to supplement the state toolkits.
* Tsunami outreach products need to be developed that meet the special needs of these groups within their corresponding states and jurisdictions.
* Tsunami education products will be developed for the tourist (cruises, hotels and vacation rental homes) and business communities.
* To enhance tsunami education in the schools, educational toolkits and curricula for educators will be made available electronically and in a non-proprietary format.
* Evaluations and surveys will be conducted to determine the effectiveness of tsunami education products and the level of preparedness.
* Promote innovative outreach events to help inform local public and reach broad audiences (e.g., fairs, mall kiosks, and community workshops).
* Develop and distribute outreach materials as needed while attempting to utilize existing materials developed within the NTHMP and elsewhere.
* Propose a National Tsunami Awareness week.

Outcome: Establishment of more Tsunami Resilient Communities

Resilience is the capacity to cope with unanticipated danger after they have become manifest, learning to bounce back (Wildavsky, 1991). The Tsunami Warning and Education Act directs the NTHMP to seek ways to make communities more tsunami resilient through the use of inundation maps and other mitigation practices. Tsunami resilient communities are not only prepared to respond to tsunamis, but also protect existing development from tsunami losses, take special precautions in locating and designing infrastructure and have plans in place to recover if a tsunami should strike.

Strategies:

* Provide funding through NTHMP grant program to provide communities resources necessary to obtain TsunamiReady recognition.
* NTHMP will support a greater number of communities to become TsunamiReady.
* Support reviews of the TsunamiReady program.
* The NTHMP will support and convene meetings to discuss improvements that can be made to the TsunamiReady Program.
* Support a research effort to develop U.S. tsunami risk assessment methodologies.
* The NTHMP will develop quantitative tsunami risk analysis techniques, including the source determination and probability of occurrence.
* The NTHMP will determine the applicability of economic and loss estimation tools (eg. HAZUS to gain a better understanding of the potential impact of tsunamis in the U.S.).

D. WARNING COORDINATION OUTCOMES and STRATEGIES

Warning Coordination outcomes relate to the content and delivery of the operational Tsunami Warning System's (TWS) products. The NTHMP is a guidance body to the NOAA-operated U.S. TWS and provides recommendations on the format and content of Tsunami Warning Center (TWC) domestic messages. The NTHMP also takes an active role in assuring the local delivery of TWC products. The NTHMP supports community warning point reception and dissemination equipment and provides for coordination of TWS exercises and tests.

Outcome: Understandable and effective Tsunami Warning Center Products

* Since these products are received so rarely, they must be clear and concise in content.
* Graphical products must support textual content and provide straight-forward information.

Strategies:

* Provide guidance to refine TWC products.
* Product guidance will be provided to the TWCs through the WCS.

Outcome: Effective and Reliable Warning Dissemination to people at risk.

One of the biggest challenges facing the Tsunami Warning System is tsunami message delivery to those at risk. TWCs utilize standard NWS message dissemination routes such as NOAA Weather Radio, NOAA Weather Wire, Emergency Managers Weather Information Network, and others. Products issued over these routes provide local emergency management guidance when making decisions regarding evacuation. It is critical for proper operation of the TWS that local emergency management have reliable TWC product reception and the capability to distribute the message to those at risk.

Strategies:

* Encourage authorities to receive and respond to Tsunami Warning Center products.
* The WCS will provide the coordination mechanism for system-wide communication tests as well as set up a review process to determine TWS effectiveness during events which prompt tsunami warnings.
* Monthly or quarterly communication tests will be conducted by the TWCs to ensure message receipt by primary recipients.
* Annual end-to-end tests will be conducted using the live tsunami warning Emergency Alert System code and over NOAA Weather Radio when approved by the state.
* NTHMP will encourage an increase in the number of states participating in the annual end-to-end testing of the Tsunami Warning System.
* Advocate for continual tsunami detection and warning system improvements.
* The NTHMP is in a position to advocate for improvements to the operational tsunami warning sytem. This advocacy will take the form of joint state letters to congressional members, CC recommendations to NOAA leadership, and/or interaction with the Congressional Hazards Caucus.
* Improve local warning dissemination capabilities to people at risk.
* The WCS will conduct an inventory of dissemination capabilities at threatened communities throughout the coastal U.S.
* Based on this inventory, the WCS will take the actions necessary to improve dissemination capabilities at threatened communities nationwide.
* Improve community warning point reception capabilities.
* The WCS will conduct an inventory of community warning reception capabilities.
* Based on this inventory the WCS will take actions necessary to improve warning information reception in threatened communities nationwide.