

Tsunami Warning and Education Act

[Public Law 109–479]

[As Amended Through P.L. 115–25, Enacted April 18, 2017]

【Currency: This publication is a compilation of the text of title VIII of Public Law 109-479. It was last amended by the public law listed in the As Amended Through note above and below at the bottom of each page of the pdf version and reflects current law through the date of the enactment of the public law listed at <https://www.govinfo.gov/app/collection/comps/>】

【Note: While this publication does not represent an official version of any Federal statute, substantial efforts have been made to ensure the accuracy of its contents. The official version of Federal law is found in the United States Statutes at Large and in the United States Code. The legal effect to be given to the Statutes at Large and the United States Code is established by statute (1 U.S.C. 112, 204).】

AN ACT To amend the Magnuson-Stevens Fishery Conservation and Management Act to authorize activities to promote improved monitoring and compliance for high seas fisheries, or fisheries governed by international fishery management agreements, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) 【16 U.S.C. 1801 note】 SHORT TITLE.—This Act may be cited as the “Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006”.

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.

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TITLE VIII—TSUNAMI WARNING AND EDUCATION

Sec. 801. Short title.

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TITLE VIII—TSUNAMI WARNING AND EDUCATION

SEC. 801. [33 U.S.C. 3201 note] SHORT TITLE.

This title may be cited as the “Tsunami Warning and Education Act”.

SEC. 802. [33 U.S.C. 3201] DEFINITIONS.

In this title:

(1) The term “Administration” means the National Oceanic and Atmospheric Administration.

(2) The term “Administrator” means the Administrator of the National Oceanic and Atmospheric Administration.

SEC. 803. [33 U.S.C. 3202] PURPOSES.

The purposes of this title are—

(1) to improve tsunami detection, forecasting, warnings, research, notification, outreach, and mitigation to protect life and property in the United States;

(2) to enhance and modernize the existing United States Tsunami Warning System to increase the accuracy of forecasts and warnings, to ensure full coverage of tsunami threats to the United States with a network of detection assets, and to reduce false alarms;

(3) to improve and develop standards and guidelines for mapping, modeling, and assessment efforts to improve tsunami detection, forecasting, warnings, notification, mitigation, resiliency, response, outreach, and recovery;

(4) to improve research efforts related to improving tsunami detection, forecasting, warnings, notification, mitigation, resiliency, response, outreach, and recovery;

(5) to improve, increase, and develop uniform standards and guidelines for education and outreach activities and ensure that those receiving tsunami warnings and the at-risk public know what to do when a tsunami is approaching, including the warning signs of locally generated tsunami;

(6) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide;

(7) to foster resilient communities in the face of tsunami and other similar coastal hazards; and

(8) to improve Federal, State, and international coordination for detection, warnings, and outreach for tsunami and other coastal impacts.

SEC. 804. [33 U.S.C. 3203] TSUNAMI FORECASTING AND WARNING PROGRAM.

(a) IN GENERAL.—The Administrator, through the National Weather Service and in consultation with other relevant Administration offices, shall operate a program to provide tsunami detection, forecasting, and warnings for the Pacific and Arctic Ocean regions and for the Atlantic Ocean region, including the Caribbean Sea and the Gulf of Mexico.

(b) COMPONENTS.—The program under this section shall—

(1) include the tsunami warning centers supported or maintained under subsection (d);

(2) to the degree practicable, maintain not less than 80 percent of the Deep-ocean Assessment and Reporting of Tsunamis buoy array at operational capacity to optimize data reliability;

(3) utilize and maintain an array of robust tsunami detection technologies;

(4) maintain detection equipment in operational condition to fulfill the detection, forecasting, and warning requirements of this title;

(5) provide tsunami forecasting capability based on models and measurements, including tsunami inundation models and maps for use in increasing the preparedness of communities and safeguarding port and harbor operations, that incorporate inputs, including—

(A) the United States and global ocean and coastal observing system;

(B) the global Earth observing system;

(C) the global seismic network;

(D) the Advanced National Seismic system;

(E) tsunami model validation using historical and paleotsunami data;

(F) digital elevation models and bathymetry; and

(G) newly developing tsunami detection methodologies using satellites and airborne remote sensing;

(6) maintain data quality and management systems to support the requirements of the program;

(7) include a cooperative effort among the Administration, the United States Geological Survey, and the National Science Foundation under which the Director of the United States Geological Survey and the Director of the National Science Foundation shall—

(A) provide rapid and reliable seismic information to the Administrator from international and domestic seismic networks; and

(B) support seismic stations installed before the date of the enactment of the Tsunami Warning, Education, and Research Act of 2017 to supplement coverage in areas of sparse instrumentation;

(8) provide a capability for the dissemination of warnings, including graphical warning products, to at-risk States, territories, and tsunami communities through rapid and reliable notification to government officials and the public, including utilization of and coordination with existing Federal warning systems, including the National Oceanic and Atmospheric Administration Weather Radio All Hazards Program and Wireless Emergency Alerts;

(9) provide and allow, as practicable, for integration of tsunami detection technologies with other environmental observing technologies and commercial and Federal undersea communications cables; and

(10) include any technology the Administrator considers appropriate to fulfill the objectives of the program under this section.

(c) TSUNAMI WARNING SYSTEM.—The program under this section shall operate a tsunami warning system that—

(1) is capable of forecasting tsunami, including forecasting tsunami arrival time and inundation estimates, anywhere in the Pacific and Arctic Ocean regions and providing adequate warnings;

(2) is capable of forecasting and providing adequate warnings, including tsunami arrival time and inundation models where applicable, in areas of the Atlantic Ocean, including the Caribbean Sea and Gulf of Mexico, that are determined—

(A) to be geologically active, or to have significant potential for geological activity; and

(B) to pose significant risks of tsunami for States along the coastal areas of the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico; and

(3) supports other international tsunami forecasting and warning efforts.

(d) TSUNAMI WARNING CENTERS.—

(1) IN GENERAL.—The Administrator shall support or maintain centers to support the tsunami warning system required by subsection (c). The Centers shall include—

(A) the National Tsunami Warning Center, located in Alaska, which is primarily responsible for Alaska and the continental United States;

(B) the Pacific Tsunami Warning Center, located in Hawaii, which is primarily responsible for Hawaii, the Caribbean, and other areas of the Pacific not covered by the National Center; and

(C) any additional forecast and warning centers determined by the National Weather Service to be necessary.

(2) RESPONSIBILITIES.—The responsibilities of the centers supported or maintained under paragraph (1) shall include the following:

(A) Continuously monitoring data from seismological, deep ocean, coastal sea level, and tidal monitoring stations and other data sources as may be developed and deployed.

(B) Evaluating earthquakes, landslides, and volcanic eruptions that have the potential to generate tsunami.

(C) Evaluating deep ocean buoy data and tidal monitoring stations for indications of tsunami resulting from earthquakes and other sources.

(D) To the extent practicable, utilizing a range of models, including ensemble models, to predict tsunami, including arrival times, flooding estimates, coastal and harbor currents, and duration.

(E) Using data from the Integrated Ocean Observing System of the Administration in coordination with regional associations to calculate new inundation estimates and periodically update existing inundation estimates.

(F) Disseminating forecasts and tsunami warning bulletins to Federal, State, tribal, and local government officials and the public.

(G) Coordinating with the tsunami hazard mitigation program conducted under section 805 to ensure ongoing sharing of information between forecasters and emergency management officials.

(H) In coordination with the Commandant of the Coast Guard and the Administrator of the Federal Emergency Management Agency, evaluating and recommending procedures for ports and harbors at risk of tsunami inundation, including review of readiness, response, and communication strategies, and data sharing policies, to the maximum extent practicable.

(I) Making data gathered under this Act and post-warning analyses conducted by the National Weather Service or other relevant Administration offices available to the public.

(J) Integrating and modernizing the program operated under this section with advances in tsunami science to improve performance without compromising service.

(3) **FAIL-SAFE WARNING CAPABILITY.**—The tsunami warning centers supported or maintained under paragraph (1) shall maintain a fail-safe warning capability and perform back-up duties for each other.

(4) **COORDINATION WITH NATIONAL WEATHER SERVICE.**—The Administrator shall coordinate with the forecast offices of the National Weather Service, the centers supported or maintained under paragraph (1), and such program offices of the Administration as the Administrator or the coordinating committee, as established in section 805(d), consider appropriate to ensure that regional and local forecast offices—

(A) have the technical knowledge and capability to disseminate tsunami warnings for the communities they serve;

(B) leverage connections with local emergency management officials for optimally disseminating tsunami warnings and forecasts; and

(C) implement mass communication tools in effect on the day before the date of the enactment of the Tsunami Warning, Education, and Research Act of 2017 used by the National Weather Service on such date and newer mass communication technologies as they are developed as a part of the Weather-Ready Nation program of the Administration, or otherwise, for the purpose of timely and effective delivery of tsunami warnings.

(5) **UNIFORM OPERATING PROCEDURES.**—The Administrator shall—

(A) develop uniform operational procedures for the centers supported or maintained under paragraph (1), including the use of software applications, checklists, decision support tools, and tsunami warning products that have been standardized across the program supported under this section;

- (B) ensure that processes and products of the warning system operated under subsection (c)—
 - (i) reflect industry best practices when practicable;
 - (ii) conform to the maximum extent practicable with internationally recognized standards for information technology; and
 - (iii) conform to the maximum extent practicable with other warning products and practices of the National Weather Service;
 - (C) ensure that future adjustments to operational protocols, processes, and warning products—
 - (i) are made consistently across the warning system operated under subsection (c); and
 - (ii) are applied in a uniform manner across such warning system;
 - (D) establish a systematic method for information technology product development to improve long-term technology planning efforts; and
 - (E) disseminate guidelines and metrics for evaluating and improving tsunami forecast models.
- (6) AVAILABLE RESOURCES.—The Administrator, through the National Weather Service, shall ensure that resources are available to fulfill the obligations of this Act. This includes ensuring supercomputing resources are available to run, as rapidly as possible, such computer models as are needed for purposes of the tsunami warning system operated under subsection (c).
- (e) TRANSFER OF TECHNOLOGY; MAINTENANCE AND UPGRADES.—In carrying out this section, the Administrator shall—
- (1) develop requirements for the equipment used to forecast tsunami, including—
 - (A) provisions for multipurpose detection platforms;
 - (B) reliability and performance metrics; and
 - (C) to the maximum extent practicable, requirements for the integration of equipment with other United States and global ocean and coastal observation systems, the global Earth observing system of systems, the global seismic networks, and the Advanced National Seismic System;
 - (2) develop and execute a plan for the transfer of technology from ongoing research conducted as part of the program supported or maintained under section 6 into the program under this section; and
 - (3) ensure that the Administration's operational tsunami detection equipment is properly maintained.
- (f) FEDERAL COOPERATION.—When deploying and maintaining tsunami detection technologies under the program under this section, the Administrator shall—
- (1) identify which assets of other Federal agencies are necessary to support such program; and
 - (2) work with each agency identified under paragraph (1)—
 - (A) to acquire the agency's assistance; and
 - (B) to prioritize the necessary assets in support of the tsunami forecast and warning program.

(g) CONGRESSIONAL NOTIFICATIONS.—

(1) IN GENERAL.—The Administrator shall notify the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives within 30 days of—

(A) impaired regional forecasting capabilities due to equipment or system failures;

(B) significant contractor failures or delays in completing work associated with the tsunami forecasting and warning system; and

(C) the occurrence of a significant tsunami warning.

(2) CONTENTS.—In a case in which notice is submitted under paragraph (1) within 30 days of a significant tsunami warning described in subparagraph (C) of such paragraph, such notice shall include, as appropriate, brief information and analysis of—

(A) the accuracy of the tsunami model used;

(B) the specific deep ocean or other monitoring equipment that detected the incident, as well as the deep ocean or other monitoring equipment that did not detect the incident due to malfunction or other reasons;

(C) the effectiveness of the warning communication, including the dissemination of warnings with State, territory, local, and tribal partners in the affected area under the jurisdiction of the National Weather Service; and

(D) such other findings as the Administrator considers appropriate.

SEC. 805. [33 U.S.C. 3204] NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM.

(a) PROGRAM REQUIRED.—The Administrator, in coordination with the Administrator of the Federal Emergency Management Agency and the heads of such other agencies as the Administrator considers relevant, shall conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness and resiliency of at-risk areas in the United States and the territories of the United States.

(b) COORDINATING COMMITTEE.—In conducting the program under this section, the Administrator shall establish a coordinating committee comprising representatives of Federal, State, local, and tribal government officials. The Administrator may establish subcommittees to address region-specific issues. The committee shall—

(1) recommend how funds appropriated for carrying out the program under this section will be allocated;

(2) ensure that areas described in section 804(c) in the United States and its territories can have the opportunity to participate in the program;

(3) provide recommendations to the National Weather Service on how to improve the TsunamiReady program, particularly on ways to make communities more tsunami resilient through the use of inundation maps and other mitigation practices; and

(4) ensure that all components of the program are integrated with ongoing hazard warning and risk management activities, emergency response plans, and mitigation programs in

affected areas, including integrating information to assist in tsunami evacuation route planning.

(c) PROGRAM COMPONENTS.—The Program conducted under subsection (a) shall include the following:

(1) Technical and financial assistance to coastal States, territories, tribes, and local governments to develop and implement activities under this section.

(2) Integration of tsunami preparedness and mitigation programs into ongoing State-based hazard warning, resilience planning, and risk management activities, including predisaster planning, emergency response, evacuation planning, disaster recovery, hazard mitigation, and community development and redevelopment planning programs in affected areas.

(3) Coordination with other Federal preparedness and mitigation programs to leverage Federal investment, avoid duplication, and maximize effort.

(4) Activities to promote the adoption of tsunami resilience, preparedness, warning, and mitigation measures by Federal, State, territorial, tribal, and local governments and non-governmental entities, including educational and risk communication programs to discourage development in high-risk areas.

(5) Activities to support the development of regional tsunami hazard and risk assessments. Such regional risk assessments may include the following:

(A) The sources, sizes, and other relevant historical data of tsunami in the region, including paleotsunami data.

(B) Inundation models and maps of critical infrastructure and socioeconomic vulnerability in areas subject to tsunami inundation.

(C) Maps of evacuation areas and evacuation routes, including, when appropriate, traffic studies that evaluate the viability of evacuation routes.

(D) Evaluations of the size of populations that will require evacuation, including populations with special evacuation needs.

(E) Evaluations and technical assistance for vertical evacuation structure planning for communities where models indicate limited or no ability for timely evacuation, especially in areas at risk of near shore generated tsunami.

(F) Evaluation of at-risk ports and harbors.

(G) Evaluation of the effect of tsunami currents on the foundations of closely-spaced, coastal high-rise structures.

(6) Activities to promote preparedness in at-risk ports and harbors, including the following:

(A) Evaluation and recommendation of procedures for ports and harbors in the event of a distant or near-field tsunami.

(B) A review of readiness, response, and communication strategies to ensure coordination and data sharing with the Coast Guard.

(7) Activities to support the development of community-based outreach and education programs to ensure community readiness and resilience, including the following:

(A) The development, implementation, and assessment of technical training and public education programs, including education programs that address unique characteristics of distant and near-field tsunami.

(B) The development of decision support tools.

(C) The incorporation of social science research into community readiness and resilience efforts.

(D) The development of evidence-based education guidelines.

(8) Dissemination of guidelines and standards for community planning, education, and training products, programs, and tools, including—

(A) standards for—

(i) mapping products;

(ii) inundation models; and

(iii) effective emergency exercises; and

(B) recommended guidance for at-risk port and harbor tsunami warning, evacuation, and response procedures in coordination with the Coast Guard and the Federal Emergency Management Agency.

(d) AUTHORIZED ACTIVITIES.—In addition to activities conducted under subsection (c), the program conducted under subsection (a) may include the following:

(1) Multidisciplinary vulnerability assessment research, education, and training to help integrate risk management and resilience objectives with community development planning and policies.

(2) Risk management training for local officials and community organizations to enhance understanding and preparedness.

(3) In coordination with the Federal Emergency Management Agency, interagency, Federal, State, tribal, and territorial intergovernmental tsunami response exercise planning and implementation in high risk areas.

(4) Development of practical applications for existing or emerging technologies, such as modeling, remote sensing, geospatial technology, engineering, and observing systems, including the integration of tsunami sensors into Federal and commercial submarine telecommunication cables if practicable.

(5) Risk management, risk assessment, and resilience data and information services, including—

(A) access to data and products derived from observing and detection systems; and

(B) development and maintenance of new integrated data products to support risk management, risk assessment, and resilience programs.

(6) Risk notification systems that coordinate with and build upon existing systems and actively engage decision-makers, State, local, tribal, and territorial governments and agencies, business communities, nongovernmental organizations, and the media.

(e) NO PREEMPTION WITH RESPECT TO DESIGNATION OF AT-RISK AREAS.—The establishment of national standards for inundation models under this section shall not prevent States, territories, tribes, and local governments from designating additional areas as being at risk based on knowledge of local conditions.

(f) NO NEW REGULATORY AUTHORITY.—Nothing in this Act may be construed as establishing new regulatory authority for any Federal agency.

SEC. 806. [33 U.S.C. 3205] TSUNAMI RESEARCH PROGRAM.

(a) IN GENERAL.—The Administrator shall, in consultation with such other Federal agencies, State, tribal, and territorial governments, and academic institutions as the Administrator considers appropriate, the coordinating committee under section 805(d), and the panel under section 808(a), support or maintain a tsunami research program to develop detection, forecast, communication, and mitigation science and technology, including advanced sensing techniques, information and communication technology, data collection, analysis, assessment for tsunami tracking and numerical forecast modeling, and standards development.

(b) RESPONSIBILITIES.—The research program supported or maintained under subsection (a) shall—

(1) consider other appropriate and cost effective solutions to mitigate the impact of tsunami, including the improvement of near-field and distant tsunami detection and forecasting capabilities, which may include use of a new generation of the Deep-ocean Assessment and Reporting of Tsunamis array, integration of tsunami sensors into commercial and Federal telecommunications cables, and other real-time tsunami monitoring systems and supercomputer capacity of the Administration to develop a rapid tsunami forecast for all United States coastlines;

(2) coordinate with the National Weather Service on technology to be transferred to operations;

(3) conduct social science research to develop and assess community warning, education, and evacuation materials;

(4) develop the technical basis for validation of tsunami maps, numerical tsunami models, digital elevation models, and forecasts; and

(5) ensure that research and findings are available to the public and the scientific community.

SEC. 807. [33 U.S.C. 3206] GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.

(a) SUPPORT FOR DEVELOPMENT OF AN INTERNATIONAL TSUNAMI WARNING SYSTEM.—The Administrator shall, in coordination with the Secretary of State and in consultation with such other agencies as the Administrator considers relevant, provide technical assistance, operational support, and training to the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization, the World Meteorological Organization of the United Nations, and such other international entities as the Administrator considers appropriate, as part of the international efforts to develop a fully functional global

tsunami forecast and warning system comprised of regional tsunami warning networks.

(b) **INTERNATIONAL TSUNAMI INFORMATION CENTER.**—The Administrator, through the National Weather Service and in consultation with other relevant Administration offices, in cooperation with the Intergovernmental Oceanographic Commission, may operate an International Tsunami Information Center to improve tsunami preparedness for all Pacific Ocean nations participating in the International Tsunami Warning System of the Pacific, and may also provide such assistance to other nations participating in a global tsunami warning system established through the Intergovernmental Oceanographic Commission. As part of its responsibilities around the world, the Center may—

(1) monitor international tsunami warning activities around the world;

(2) assist member states in establishing national warning systems, and make information available on current technologies for tsunami warning systems;

(3) maintain a library of materials to promulgate knowledge about tsunami in general and for use by the scientific community; and

(4) disseminate information, including educational materials and research reports.

(c) **DETECTION EQUIPMENT; TECHNICAL ADVICE AND TRAINING.**—In carrying out this section, the National Weather Service—

(1) shall give priority to assisting nations in identifying vulnerable coastal areas, creating inundation maps, obtaining or designing real-time detection and reporting equipment, and supporting communication and warning networks and contact points in each vulnerable nation;

(2) may support a process for transfer of detection and communication technology to affected nations for the purposes of supporting the international tsunami warning system; and

(3) shall provide technical and other assistance to support international tsunami programs.

(d) **DATA-SHARING REQUIREMENT.**—The National Weather Service, when deciding to provide assistance under this section, may take into consideration the data sharing policies and practices of nations proposed to receive such assistance, with a goal to encourage all nations to support full and open exchange of data.

SEC. 808. [33 U.S.C. 3206a] TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY PANEL.

(a) **DESIGNATION.**—The Administrator shall designate an existing working group within the Science Advisory Board of the Administration to serve as the Tsunami Science and Technology Advisory Panel to provide advice to the Administrator on matters regarding tsunami science, technology, and regional preparedness.

(b) **MEMBERSHIP.**—

(1) **COMPOSITION.**—The Panel shall be composed of no fewer than 7 members selected by the Administrator from among individuals from academia or State agencies who have academic or practical expertise in physical sciences, social sciences, information technology, coastal resilience, emergency

management, or such other disciplines as the Administrator considers appropriate.

(2) **FEDERAL EMPLOYMENT.**—No member of the Panel may be a Federal employee.

(c) **RESPONSIBILITIES.**—Not less frequently than once every 4 years, the Panel shall—

(1) review the activities of the Administration, and other Federal activities as appropriate, relating to tsunami research, detection, forecasting, warning, mitigation, resiliency, and preparation; and

(2) submit to the Administrator and such others as the Administrator considers appropriate—

(A) the findings of the working group with respect to the most recent review conducted under paragraph (1); and

(B) such recommendations for legislative or administrative action as the working group considers appropriate to improve Federal tsunami research, detection, forecasting, warning, mitigation, resiliency, and preparation.

(d) **REPORTS TO CONGRESS.**—Not less frequently than once every 4 years, the Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science, Space, and Technology of the House of Representatives a report on the findings and recommendations received by the Administrator under subsection (c)(2).

SEC. 809. [33 U.S.C. 3207] AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administrator to carry out this title—

(1) \$25,000,000 for fiscal year 2008, of which—

(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;

(2) \$26,000,000 for fiscal year 2009, of which—

(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;

(3) \$27,000,000 for fiscal year 2010, of which—

(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;

(4) \$28,000,000 for fiscal year 2011, of which—

(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;

(5) \$29,000,000 for fiscal year 2012, of which—

(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806; and

(6) \$25,800,000 for each of fiscal years 2016 through 2021, of which—

(A) not less than 27 percent of the amount appropriated for each fiscal year shall be for activities conducted at the State level under the tsunami hazard mitigation program under section 805; and

(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806.

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